AMERICAN NURSERYMAN

The Nurseryman's Forte: To Make America More Beautiful and Fruitful

OCTOBER 1, 1943

Fagus Sylvatica

AMERICAN NURSERYMAN

P. R. KILNER, Editor

Editorial

ARE THEY PROFITS?

When they totaled the figures for last spring's business, some nurserymen were gratified to note that although they had done less business than in normal years, they had almost the same amount of profit, and in some cases more. They had declined some planting jobs, curtailed service to customers in some respects and handled less nursery stock—simply because they did not have enough labor to do otherwise. Hence they saved money on wages. They bought as little stock as possible from other sources and used their own. They did less planting of lining-out stock than in other years. They could buy no new automobiles, trucks or farm machinery, except in rare instances, but they got along pretty well with the old equipment. All in all, these nurserymen were quite pleased that they had done as well as they had, in spite of all the handicaps, particularly when that bank balance showed its plump figures.

Here and there, however, the thought came glimmering that while those plump figures might please Secretary Morgenthau, because he would get a considerable slice in income taxes, perhaps these nurserymen themselves were not so well off as they imagined. They had sold stock out of their fields for which they had been paying the cost of cultivation for several years, but no new liners were planted to replace it. If they use the inventory method in reporting for income tax purposes, how much of their profit was produced in this way becomes clear—but how many nurserymen carry an inventory of growing stock?

Their automobiles, trucks, farm machinery, office equipment, etc., are a year older, without replacements. If a depreciation reserve is part of the bookkeeping system, that will provide for the new equipment that must be bought sooner or later, when it is available. Do you have a depreciation reserve?

Because help was scarce, cultivating was probably not done thoroughly, and the stock shows it. Repairs on buildings and equipment were postponed. Work on roads, fences, etc., was put off until another year. Labor used in those ways in other years was commonly charged to expense; so no wonder your expenses are down this year and profits are up!

Yet next year or the year after, all those things will have to be done, equipment and property repairs will have to be made, trucks and machinery replaced, lining-out stock purchased and supplies replenished. It is doubtful if provision for these is made by suitable reserves in any nurseryman's bookkeeping system. Out of the considerable sum you have saved on labor, no doubt a considerable chunk will be paid in income taxes, at the current high rates.

Will you have the money, then, for repairs, replacements, stock and supplies when they must be paid for, next year or the year after, as a necessity of continuing in business?

When all of these things are considered, much of that glow of satisfaction over the high profits because of the saving in labor and other expenditures disappears. Consequently, some of these nurserymen with the profits in the bank think they would be wiser if they tried to get a little more help, put the stock in the fields in better shape, plant more this fall if possible, remedy the neglect to grounds and buildings, put in good repair the equipment which may have to be used a considerable time longer and, above all, replenish the inventory, or else stock to sell may be lacking when business is good and labor is available later on.

Take a good look at your nursery and your equipment before you consider as profit all the money in the bank. More likely you have been turning some of your capital assets into cash, instead of earning money.

The Mirror of the Trade

PAPER CONTAINERS.

Reporting at the recent Cincinnati meeting on the scarcity of box lumber for shipping nursery stock, Arthur H. Hill predicted that the future would bring greater use of paperboard containers in this field. More serious consideration to that prediction might be given by other shippers of nursery stock in the light of an article on the paper industries in Barron's weekly for September 20, which contained these two paragraphs:

"More than half of all the paper produced in the United States today is believed to be used in the manufacture of victory and other containers for the war effort, and it is understood that great technical improvements have been achieved in their construction, so that today goods of every character are being sent overseas in paper containers that afford absolute protection. In the first year after Pearl Harbor, for example, the paper container did not always prove satisfactory, but so great has been the improvement in the interim that it is said that those being made today can be thrown in the sea, allowed to drift ashore and will keep in good condition almost indefinitely.

"Unquestionably, the paper container is destined to replace wood and glass in innumerable fields. Until recently, it was not thought possible to use paper crates for the storage of eggs and butter for the reason that condensation in cold storage plants creates moisture, which is ruinous to the ordinary paper container. Recently, however, the industry has perfected a laminated board with a plastic adhesive that is said to be absolutely waterproof."

THE GO-GIVER POLICY.

Time has taken away much of the luster of the so-called go-getter type of selling of the 1920's. In its place the go-giver spirit is recommended as an advertising formula in a recent issue of the Friendly Adventurer, the house organ of Bermingham & Prosser Co., Chicago paper firm. Think about this when you are next writing copy for a sales letter or for your catalogue:

In writing an advertisement, planning a direct-mail piece or getting out a sales letter, what is our usual mental process? How can I "knock 'em cold"? How can I get returns? We think in terms of hitting hard. We think in terms of punch and knockouts. Superlatives flame from our advertising guns. The buyer knows we are trying to get him and runs for his dugout. The louder we shout the faster the buyer retreats.

How can we reverse the usual process and put the go-giver spirit into our advertising? The first step is to forget what you are going to get out of the advertising. Think in terms of what the prospect can get out of your product or service. Make a list of the things your product will give the prospect in value, service, helpfulness, happiness, inspiration. Be sure that everything your product gives is listed simply, sincerely and honestly in every piece of advertising you send out.

Go-giver advertising not only wins customers, but it holds them. It builds repeat business. It is the solid rock upon which many a successful business has been built.

SOME nurserymen have been highly successful the past summer in using women and high school boys for labor. Important are supervision and crew organization.

AMERICAN NURSERYMAN

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Letters from Readers

HERE ARE EXACT FIGURES.

I was interested in the editorial in the August 1 issue, "What Are Your Figures?" especially as it reported the opinions of big operators in the nursery business. Curiosity prompted me to check our figures of the past three years with their conclusions, namely, average for labor fifty-five per cent, average for supplies and material fifteen per cent, average for overhead thirty per cent. From our records, these ten nurserymen, all experts, hit the percentages on labor and material, but missed by one-half on overhead.

From the tabulation below, our records show (1) average labor fifty-one and one-tenth per cent (production plus overhead), (2) average material and supplies fifteen and three-tenths per cent (production only), (3) average overhead sixty-one per cent. The point I wish to make is that the biggest single item in nursery costs, namely overhead, is the one most of us underestimate.

It is my opinion that prices on most nursery products are established without due consideration of overhead. Since 1932 our records show overhead to be sixty to seventy per cent of our cost. Our records show:

	1940 Per cent	1941 Per cent	1942 Per cent	Average Per cent
Labor (not overhead)	21	26	24	23.7
Material	12	19	15	15.3
Total production	33	45	39	39.0
Salaries	13	16.1	17	15.4
Taxes, insurance, interest, rent	7	7.6	12	8.85
Sales and office expenditures	3	1.0	2.5	2.15
Horses for nursery (feed and labor)	2	2.0	2.0	2.0
Trucks and motor equipment	9	3.0	3.5	5.2
Labor (not production)	33	25.3	24.0	27.4
Total overhead	67	55.0	61.0	61.0

In 1942 our business was sixty-five per cent wholesale, twenty-eight per cent retail and seven per cent landscape. In normal years it is about sixty per cent, twenty-five per cent and fifteen per cent, respectively. Our wholesale trade constitutes truck deliveries within a radius of 150 miles. Our retail business consists of telephone, mail and personal calls with delivery by our trucks; our landscape operations comprise deliveries and plantings by our own men. Our records show that landscape business, as far as we are concerned, is a losing department. We are gradually eliminating it.

We propagate ninety-five per cent of our evergreens and buy five per cent as lining-out stock. Our sales therefore are nearly 100 per cent of our own growing. Other ornamentals are bought in salable sizes, lined out for a year and resold. The ratio runs ten per cent of our own growing to ninety per cent by purchase.

"Overhead labor (not production)" is all labor necessary to the operation of the business which cannot be charged directly to production accounts. Labor in planting would be charged directly to the stock on which it was expended, and would not appear in overhead labor, while labor in delivery of stock would be charged as overhead labor. Likewise, labor in plowing and tilling land on which type of stock to be planted is questioned would appear as overhead labor. After this land is planted, all labor of any kind is charged directly to the stock planted thereon.

Our system is not complicated, but it does require some detail. It is mathematically correct, because every cent we expend in operating is charged against the growing stock

E. B. Stedman,
Stedman Nurseries.

VICTORY HARVEST SHOWS.

Where the gardening public has been accustomed to autumn shows, as in Massachusetts, the victory garden harvest shows held recently drew many entries and large attendances. The event at Boston was held at Horticultural hall, September 11 to 13, with many amateur contestants. The local seed houses staged good displays. The Weston Nurseries, Weston, Mass., received a silver medal certificate for its display of flowers, fruits and vegetables.

The same firm made an outstanding exhibit on the same dates at the show at Wellesley, Mass., another exhibition with a paid attendance that was quite gratifying.

At Philadelphia, September 15 and 16, the victory garden show was staged under a huge tent on the parkway. The outstanding exhibit was staged by the Philadelphia branch of the National Gardeners' Association, covering a space of 1,000 square feet with vegetables, fruits and berries.

The Chicago harvest festival, September 9 to 11, was held under the stands at Soldier Field, the big stadium on the lake front. Promoted by a daily newspaper, it was accompanied by special programs, but both exhibits and attendance were light, though the show was free.

At Milwaukee, Wis., florists and gladiolus growers helped fill the auditorium with a beautiful display, but the victory garden exhibits were weak on account of the continued drought, and the promoting newspaper received little return because of the disappointing attendance.

OHIO ASSOCIATION NOTES.

At the conclusion of the recent meeting of the Ohio Nurserymen's Association at Cincinnati, the executive committee made plans for the annual meeting, to be held at the Deshler-Wallick hotel, Columbus, January 20 and 21. Suggestions for the program included more specific studies of postwar activities, costs of nursery production, memorial plantings, machinery and equipment, soil practices and elevating the industry.

As a committee to wait upon the state highway commission and upon the commission appointed by the legislature for the study of highway reclassification and parkway development, President Melvin E. Wyant appointed W. A. Natorp, chairman; J. Howard Burton, Paul Kallay, Walter Burwell and Clarence O. Siebenthaler.

Secretary John D. Siebenthaler has sent to each member of the association the complete minutes of the meeting, consisting of six mimeographed pages.

FIRE AT INDIANA NURSERY.

Fire destroyed five buildings of the Hillsdale Landscape Co., Indianapolis, Ind., September 17, causing damage estimated at $20,000. The cause of the blaze was undetermined. It started in a blacksmith shop, spreading to an implement barn, in which a tractor valued at $2,000 was stored, and later destroying a hay barn and two other buildings. Grass seeds valued at $1,000, farm machinery, twenty tons of hay and 350 bushels of grain were lost. Firemen prevented the destruction of a potting shed, and a storage room and the office and main residence were saved. The fire was discovered early in the morning by one of the nursery's employees. The owner of the business, Alex Tuschinsky, was away on vacation at the time of the fire. The loss is covered in part by insurance.

Californians Discuss War Problems

Problems of the nursery trade during war and prospects for its postwar future were thoroughly discussed at the thirty-third annual meeting of the California Association of Nurserymen, held September 22 and 23, at the Carrillo hotel, Santa Barbara.

Tuesday afternoon, September 21, the day before the convention, chapter presidents and members of the board of directors met in the Garden room of the Carrillo hotel for a round-table discussion. Registration the morning of September 22 was followed by the opening session, which included the call to order by President John McDonnell; the pledge of allegiance, by Clarence Cadwell, and a welcoming speech by Patrick Maher, mayor of Santa Barbara. Clarence Mets, Ventura, responded to the mayor's address, and then Bert Kallman, convention chairman, made announcements about the program.

John McDonnell, Oakland, delivered the president's annual message, after which Gordon Wallace, secretary-treasurer, presented his report, and committee appointments were announced.

"The Nurseryman's Part in the Winter and Spring Gardens" was discussed by Norvel Gillespie, San Francisco, former OCD garden director for the state of California and now the conductor of a radio program. He paid tribute to the nursery industry for its part in furthering the victory garden program, but added that a concerted campaign is needed immediately if the fall and winter programs are to prove a success. He noted that the total number of victory gardens has dropped considerably below previous numbers, and he called for an immediate program of advertising to maintain home food production and so make available more food for our fighting forces and our allies.

Mr. Gillespie advocated the placing of more attention by nurserymen to merchandising and advertising methods as one of the best means of furthering profitable business.

His talk preceded an open forum discussion of the Japanese problem, conducted by Ray Hartman and Sydney Whitehorn, with Dr. John Lechner, Los Angeles, as the principal speaker.

W. J. Cecil, director of the California state department of agriculture, delivered an address in which he branded the prospective widespread program of agriculture as "bootstrap economics" and called for an adequate program of taxation and forced savings as the best means of combating inflation. Although he concurred flatly with the necessity of price ceilings, he stated, "We're just kidding ourselves if we think we can control inflation by price ceilings alone. But what we must have is 'honest' price ceilings."

Mr. Cecil took a pessimistic view of the over-all food picture, pointing out that official statistics of the War Food Administration itself demonstrate the impossibility of the hope that the United States can become the bread basket of the world. In a more optimistic vein, he stated that nurserymen and seedsmen will experience a profitable period of business in furnishing war-devastated areas with seeds and plant stocks for a revival of agriculture abroad.

Bert T. Kallman

After a period of discussion following Mr. Cecil's address, the afternoon session was adjourned. Dinner, with entertainment and dancing, was held at El Cortijo in the evening.

Thursday morning's session, September 23, opened, after a breakfast meeting of the California chapter of the American Association of Nurserymen, with an address by Richard P. White, Washington, D. C., executive secretary of that organization. Mr. White painted a brilliant picture of the postwar possibilities of the nursery trade, stating, "The nursery business goes up and down with construction in normal times, and we have every reason to believe that there will be one million new homes built annually in this country for ten years following the war."

He cited the postwar boom in highway construction and its need for ornamental border plants as another big source of business. Still another large market will exist, he said, in a carry-over of the desire on the part of victory gardeners to "keep their fingers in the soil." Millions of Americans, he stated, who have practiced gardening for the first time during this war will continue their outdoor experience, but will convert from vegetable growing to flowers and other ornamental plants.

Basing his contention on the possibilities of postwar inflation, Mr. White pointed out that nurserymen must obtain higher prices for their products in future years.

One of the big problems of the nurseryman after the war, said Mr. White, will be the replacement of his sold-out inventories. Ornamental plants have been pushed into the background by the nurserymen's food plant production during the war, and stocks are alarmingly low.

After the discussion which followed Mr. White's talk, Clarence Hall, Ventura, national president of the American Begonia Society, gave an address on "An Outsider's View of the Nursery Business."

Members of the California Association of Nurserymen took time out from business sessions at noon to visit Botanic Garden and to hear a lecture on ceanothus, by Maunsell Van Rensselaer, director of the garden. The lecture, which was illustrated, was held in the Blaksley library.

Afternoon sessions on the last day of the convention were devoted mainly to round-table discussions on current nursery problems. Clarence Mets was chairman of the discussion. John A. Armstrong, of Armstrong Nurseries, Inc., talked on "What Will We Have to Sell?" Byron Reynolds, of Bandini Fertilizer Co., discussed "What Will We Have for Fertilizer?" Jock Brydon, Lompoc, spoke on "What Is the Seed Outlook?" W. J. Cecil, of the state department of agriculture, talked on "What Will We Get for Our License Dollars?"

Reports of committees, election of officers and discussion of next year's convention concluded the afternoon session and wound up the business of the convention. The following officers were elected for the coming year: President, Bert Kallman, Santa Barbara; vice-president, Clyde Stock-

ing, San Jose, and secretary-treasurer, Gordon Wallace, San Jose, reelected.

Members of the board of directors, whose terms expire in January, are Donald Perry, San Anselmo; Fred Wittsche, Sacramento; Charles G. Armstrong, Sacramento; Sydney Whitehorn, Fresno; Clarence Mets, Ventura; Thomas Edwards, Montebello; Stanley Weiss, Burbank; Paul Moulder, Burbank; Charles Burr, Niles; Arthur Lloyd, Sacramento; Lester Meriweather, Whittier, and L. P. Sorenson, Bakersfield.

In the meantime, while election of officers and last-minute business were being taken care of by the men during the afternoon of September 23, the women's auxiliary of the association visited several famous gardens in the vicinity of Santa Barbara, under the guidance of Mrs. E. O. Orpet. At 4 o'clock, they were guests at a tea, with Mrs. Arthur Verhelle serving as hostess. Mrs. John McDonnell was president of the auxiliary and Mrs. Frank James was secretary.

The convention ended with a banquet, complete with entertainment and dancing, held at the Montecito Country Club.

Bert Kallman was general chairman of this successful convention. He was assisted by Ed Bordeau, chairman of the finance committee; Clarence Mets, chairman of the program committee, and Gus Coleman, chairman of the reception and registration committee. Members of the finance committee included John Hartfelt, C. Mavro Warren, Clarence Mets and J. H. Hume. Those who served on the program committee were John McDonnell, Gordon Wallace, E. O. Orpet and Clarence Cadwell. Velma Cadwell and A. Perley assisted in reception and registration.

Mrs. Clarence Mets was chairman of the women's auxiliary committee, which planned the affairs for the ladies. She was assisted by Mrs. Bert Kallman, Mrs. Arthur Verhelle, Mrs. C. M. Warren and Mrs. E. O. Orpet.

HENRY N. BOYD.

While climbing up the ladder in trade associations in his state and region, Henry N. Boyd has become prominent also in local business circles. He is now serving as vice-president of the Tennessee Junior Chamber of Commerce and is in charge of all war services for the state Jaycees. He is past president of the McMinnville Junior Chamber of Commerce and is still serving as secretary of the McMinnville Rotary Club after four years in that capacity.

At the meeting of the Southern Nurserymen's Association at Atlanta, August 30 and 31, he was elected vice-president of that organization, after having been chairman of the executive committee for the preceding two years.

In July he was elected vice-president of the Tennessee Nurserymen's Association and also secretary of the Tennessee chapter of the American Association of Nurserymen.

He is a son of Fernando C. Boyd and an energetic associate with him in the Boyd Nursery Co., McMinnville, Tenn.

OBITUARY.

Ernest T. Zollinger.

Flight Officer Ernest T. Zollinger, 23-year-old son of Theodore J. Zollinger, proprietor of the Ridgeway Nurseries, St. Matthews, Ky., was killed in action in the European theater of war September 17. Former captain of the Anchorage high school football team, he volunteered with the Royal Canadian air force in September, 1941, and received his wings in October, 1942. Assigned to duty in England in December, 1942, as a fighter pilot attached to the R. A. F., he transferred to the American air corps as a flight officer in June, 1943, being stationed in England and flying a P-47.

Surviving is his younger brother, Henry T. Zollinger, who enlisted in the navy in July, 1942, received training at the Great Lakes station and attended the radio school at the University of Chicago. A radio man second class, he went to sea in March, 1943, and is now somewhere in the south Pacific.

He leaves, besides his parents and brother, five sisters, Marie, Elinor, Martha, Ann and Elizabeth.

Henry N. Boyd

Lawrence W. Draher.

Lawrence William Draher, Bridgeport, Mich., died suddenly September 4. Funeral services were held at Frankenmuth and burial at Pigeon, Mich., where he was born fifty-six years ago.

Upon graduation from college, Mr. Draher began his career in the nursery business as agent for the I. E. Ilgenfritz' Sons Co. and also the Greening Nursery Co., Monroe, Mich. He started his own business in 1920 and nine years later bought the present location at Bridgeport.

Mr. Draher is survived by his widow, his parents, a brother and three sisters.

Mrs. Draher will continue the business.

WINTER MEETINGS.

At the request of officers of other associations, who wish to set dates in as little conflict with other state meetings as possible, the following calendar of next winter's trade meetings has been prepared from the information now available. Additions to the list, or further data as to city or hotel that is to be the meeting place, are invited, as well as corrections if any.

January 3, 1944, Georgia State Nurserymen's Association.

January 4 to 6, Western Association of Nurserymen, Kansas City, Mo.

January 7 and 8, Iowa Nurserymen's Association.

January 7 and 8, Oklahoma State Nurserymen's Association, Oklahoma City.

January 11 to 13, Illinois State Nurserymen's Association, Hotel La Salle, Chicago.

January 14, New York State Nurserymen's Association, Rochester.

January 18 and 19, Indiana Nurserymen's Association, Indianapolis.

January 20 and 21, Ohio Nurserymen's Association, Deshler-Wallick hotel, Columbus, following short course at Ohio State University, January 18 and 19.

January 25 or 26, New Jersey Association of Nurserymen, Trenton.

January 27 and 28, Michigan Association of Nurserymen, Detroit.

February 1 to 3, New England Nurserymen's Association.

February 2 and 3, Wisconsin Nurserymen's Association, Milwaukee.

NEW PLANT PATENTS.

The following plant patents were issued last month, according to Rummler, Rummler & Davis, Chicago patent lawyers:

No. 600. Rose plant. Roy L. Byrum, assignor to Joseph H. Hill Co., Richmond, Ind. A new and distinct variety of hybrid tea rose plant, characterized as to novelty by its free and vigorous growing habit, the heavy production of long-pointed buds developing into large blooms borne singly on strong stems and of distinctive color in the yellow range; its high resistance to mildew and blackspot and the persistency of its heavy, leathery foliage.

Camellia Names in Catalogues

By R. J. Wilmot, Florida Agricultural Experiment Station

During the past two years, while the writer was working on the camellia variety classification announced in this magazine in May, 1941, many nursery catalogues were examined for names and descriptions of varieties. It has been found that there are many variations in spelling and descriptions from one catalogue to another and that a series of catalogues from one establishment may even show variations. One foreign catalogue listing 277 varieties had forty-nine differences between it and a previous issue. Many of the mistakes in spelling are caused by poor proofreading, some by acceptance of another grower's incorrect usage and some by the fact that a grower has never seen the name written and tried to write it the way it is pronounced.

Since many of the varieties originated in foreign countries, they carry foreign names, but little attention is given to the correct usage for the country of their origin. The French "de" or "d' " is translated "of," as is also the Latin ending "ii" or " i." In spite of this, the name Tricolor de Sieboldii is frequently encountered. The best form for this is Tricolor (Siebold).

Various titles such as count, countess or princess appear in the wrong form for their respective countries. Duke and duchess are respectively duc and duchesse in French, princess is princesse in French and principessa in Italian, count or earl is comte in French and conte in Italian, countess is comtesse in French and contessa in Italian. Compte translates "account" or "reckoning" from the French. Marquis, the masculine title, is the same in English or French, but marchioness, the feminine, is the English for marquise. French proper names that commonly appear are correctly spelled Auguste, Adolphe, Antoinette, Aspasie, Catherine, Egerie, Guillaume, Henri, Jeannette, Marguerite, Maria, Marie and so on. Proper Italian names are Enrico, Margherita and Caterina. Japanese names cannot be written accurately, since their picture alphabet can only be transposed to ours phonetically. For this reason it would be possible to use translations of these names if an agreement could be reached.

The following are a few out of eighty or more variations that were particularly noted:

In 1825 Chandler and Buckingham, in "Camellia Britannica," announced Chandler's seedling Althae Flora. According to rules of horticultural nomenclature, their spelling has precedence over all others. It appears in various catalogues as Althea Flora, Althaeflora, Altheiflora, Altheaeflora and Altheaflora.

Van Houtte in Fl. des serres 14: 169, pl. 1456, 1861, described the variety Tricolor var. Angela Cocchi. It is found variously spelled as Angelo Cocche and Angelo Cocchi.

Brooklynia, Brooklyana and Brookliana are variations found for the variety first listed as Brooklynia in a list of American seedlings in the American Garden Magazine and Register 10: 150, 1844.

In Hovey's catalogue for 1834-35, Lord Clive's Camellia Cliveana is found. Current variations are Cliviana and Cleviana.

Morren in L'Horticulteur Belge, 2:63, pl. 29, 1834, describes the variety Donckelarii and tells that it was named for M. Donckelaer, the gardener-in-chief of the Botanic Garden of Louvain. The title under the plate is Donkelarii. Here there are three different spellings, but, according to correct usage, the first should be accepted. The variety is listed in catalogues as Donklaeri, Donkelarii, Donklerii, Doncklearia, Donkelerie and Dun Kaleri.

A fairly recent French catalogue lists the variety Dan El Websber, obviously the American variety Daniel Webster, which, by the way, has disappeared from the trade in this country, having been listed for the last time in 1900, in the knowledge of the writer, by Parsons & Co.

Duc d'Orleans is listed also as Duc of Orleans. The mixture of French and English is particularly bad.

Fimbriata, which was imported from China and came into cultivation in 1816, may be found as Alba Plena Fimbriata, Alba Fimbriata, Fimbriata Plena, Fimbriata Alba and Frimbiatta.

A variety, Gloire de Nantes, claimed as their introduction by the Guichard Soeurs of Nantes, France, appears as Glorie de Nantes, Glori de Nantes, Glory de Nantes and Gloria de Nantes.

Dr. J. S. Gunnell, of Washington, produced a seedling he called Gunnellae or Mrs. Gunnell. About the same time, J. Rintz, Jr., of Frankfort-Am-Main, produced a Gunnellii. Both were double white, but Dr. Gunnell's did not show stamens as did the German variety. Gunnelli, Guneli and Grunellii are found listed currently and described as pink or red and white.

Mrs. Abby Wilder is frequently listed as Abby Wilder or Mrs. Abbey Wilder.

The classic example noted appeared in the Cleveland Nursery Co. catalogue for 1844, where the variety Martha, usually followed by (Buist's) to indicate that it was a Buist seedling, is listed as Martha Bursts.

Valtevareda may be found as Valtavaredo, Valteveredo, Valtevaredo, Valtavareda, Valvareda, Vallevareda, Valavareda, Valereda and Vallereda.

This country has been known for its rugged individualism, but there is no reason why this should be carried over into camellia varietal nomenclature. Some agreement should be reached among the growers, at least, as to the way a name should be spelled, even if its application to a particular variety may be wrong. Rose, iris, gladiolus, dahlia and other growers have come to agreement and have cleaned house. It is suggested that the camellia growers do the same thing. Were this done, the total of a thousand or more names could be reduced by a third. This can only be done by a national committee of some kind that will function and pass on names of the varieties as they appear in the trade and new varieties as they are brought out.

The writer has sent out a report to his cooperators on his findings to date, but the time spent on this project will be wasted unless the results are accepted or rejected by the trade. All such a project can do is to point out the situation as it exists.

LIEUT. RALPH C. GRIFFING, son of W. C. Griffing, of Griffing Nurseries, Beaumont, Tex., is still stationed at Mississippi State College. Cadet W. D. Griffing is now at the U. S. M. S. radio school, Huntington, L. I., N. Y.

JAMES F. SCARFF, son of Howard N. Scarff, of W. N. Scarff's Sons, New Carlisle, O., is a cryptograph operator with a bomber command in the Mediterranean area. At one time this unit was located in the Tunisian Agricultural Botanical University.

Diagnosis of Nutritional Requirements Of Ornamental Plants

By L. C. Chadwick

Ornamental plants to be most effective should present a pleasing habit and rate of growth, attractive foliage and, in many cases, interesting flowers and fruits. Often within the course of their development, either in the nursery or later, plants do not show satisfactory growth. One of the most essential factors for good growth is an ample supply of the necessary nutrient elements.

During the past decade, outstanding progress has been made in the study of nutrient deficiencies and the so-called physiological disorders. Several of these disorders have now been traced to a deficiency of an essential element. Nutrient deficiency symptoms have been determined by general observations and by experiments in which plants were grown in quartz sand or water culture and supplied with nutrient solutions lacking each of the essential elements in turn. These observations and experiments have been exceedingly valuable in diagnosing the appearances and effects of deficiencies which may be expected under field conditions. Yet these symptoms have been largely obtained from studies in which the element was left out of the nutrient solution. This has resulted in extreme symptoms of the deficiency, which are often misleading to the grower. Under field conditions, the element in question is almost never entirely lacking. Chlorosis, for example, may never occur in the field in connection with a given element and yet that element may be a factor limiting the growth of the plant.

A large portion of the research on nutrient deficiencies has been conducted with fruits, especially citrus and apples, and field crops, notably tobacco. Recently some ornamentals, mostly flowers, have been studied.

Research on nutritional deficiencies with ornamental shrubs and trees has been quite limited, but no one will question the need for more extensive work with this group of plants. Even in the face of the present emergency it is hoped that research with this group of plants will not be discontinued entirely. Perhaps the curtailment of fertilizers for ornamental plants makes it even more important that symptoms of nutritional deficiencies be recognized. It is the purpose of this discussion to review some of the work on this subject that has been reported with the hope that it may prove a valuable aid to arborists, landscape gardeners and nurserymen in recognizing such symptoms and to give a basis for efficient application of the nutrient elements.

The Essential Elements.

Several elements are essential for plant growth. Of these only nitrogen, phosphorus and potassium are present in all so-called complete fertilizers and are the ones most often limited to plant growth. Carbon, hydrogen and oxygen are normally present in ample quantities in the atmosphere to assure growth. Calcium, iron, magnesium and sulphur may be deficient in certain soils and must be added to the complete fertilizers or supplied as separate salts. Recent experimental evidence would seem to show that some trace elements, boron and manganese and possibly copper and zinc, are necessary, at least in very small quantities, for the proper development of some plants. Each one of these elements has its own peculiarities in its effect upon plant growth. Some may be present in adequate quantities in the soil, but yet be unavailable because they are tied up in compounds the plants cannot use. In order to understand how these elements affect plant growth, a few facts may be reviewed.

Hydrogen is taken into the plant in the form of water, which composes a large percentage of the total plant. Water acts as the medium through which plant nutrients move from roots to other parts of the plant, there to become a part of such foods as sugars and amino acids, later to be transformed into cellulose and other compounds which will form the solid structure of the plant. Cells function normally only when water is present in adequate amounts to maintain turgidity. This turgidity is dependent upon a balance between intake and outgo as water and moisture vapor. Excessive concentration of salts in the soil due to overdoses of fertilizer may cause the root cells to lose water instead of absorbing it; thus the plant wilts. Decreases in cell turgidity may cause certain symptoms of malnutrition. If water is not absorbed, some of the essential elements may become limiting.

Oxygen is normally present in sufficient quantities in the air to give good plant growth. Certain cultural and planting practices may, however, bring about a deficiency of oxygen. Such a practice would be deep planting in poorly drained soils. In such cases, plant roots might not obtain sufficient oxygen to function properly. It has been estimated that as much as fifty per cent of the dry matter of a plant is made up of oxygen. It enters into combinations with all the other elements by processes of oxidation and reduction. Elements in the form of nitrites and sulphites require oxidation to become nitrates and sulphates, forms available to plants. An upset in the normal oxidation and reduction processes within the plant may cause certain malnutrition symptoms, such as iron deficiency when potassium is lacking but iron is present in ample amounts.

The source of carbon essential to plant growth is carbon dioxide of the air. Carbon dioxide in the presence of the green chlorophyll of the leaves and energy from the sun is formed into various forms of carbohydrates, proteins and fats. It is a component of cell walls, color, fragrance and all organic compounds.

Nitrogen is one of the most essential elements for plant growth. It is found in the atmosphere and is present in soils high in organic matter, but generally needs to be added in the form of nitrate or ammonium fertilizers in cultivated soils. Large quantities of elemental nitrogen are present in the air, but only the legume plants, by bacterial action within the nodules on the roots, are able to utilize this source of nitrogen. For most plants it has to be combined with hydrogen, oxygen and carbon before it is of use to growing plants. Virgin soils, high in organic matter, contain relatively large amounts of nitrogen. Recently, experimental evidence indicates that sod mulches aid in building up quantities of nitrogen in the soil. Nitrate nitrogen is in solution in the soil and is easily lost by leaching and runoff, consequently becomes the element most often limiting under cultivation.

In the plant, nitrogen enters into the structure of protoplasm, chloro-

phyll, amino acids, proteins and alkaloids. Nitrogen is needed for both the vegetative and reproductive stages of growth. Fruit men have been aware for some time that applications of a nitrogen fertilizer to soils low in nitrogen content will result in an increase in fruit set. Probably the same reaction would occur with ornamental plants grown for attractive fruits. Since nitrate nitrogen is readily available in the soil, the usual suggestion is that it be added at periods when the plant roots are active. Some recent experiments with ornamental trees have shown, however, that applications made annually over a 10-year period, in April, July and October, have resulted in similar increases in caliper growth.

Phosphorus is essential to cell division and cell wall construction. It is essential for formation of nucleic acids, nucleoproteins and possibly other materials found in almost all living cells. It aids root development, hastens maturity, stiffens tissues and stimulates flower and seed production. Since it penetrates the soil slowly when applied to the surface, it should, when possible, be incorporated thoroughly with the soil at the time of bed preparation. Practically all phosphorus is absorbed in the plant in the form of phosphates. It may counteract toxicity developing from organic acids and precipitate aluminum.

Potassium is thought to be necessary for the manufacture and translocation of starch and sugars. In this role it may act only as a catalytic agent. It may be considered as a general conditioner, in that it is influential in overcoming excessive succulence and brittleness, in hastening maturity of the plant, as an aid to seed production, and in intensifying the color of flowers. Potassium appears to be necessary for good root development and is a controlling factor in the absorption and loss of water by the plant. It has been suggested as aiding in resistance to disease, cold and other adverse conditions.

Calcium is just as essential to plant growth as nitrogen, phosphorus and potassium, but it is less often lacking in cultivated soils. Calcium exerts its influence both within the soil and also within the plant. It favors development of necessary bacteria, counteracts the toxic effects of certain salt combinations in the soil, improves its physical structure and aids in the liberation of nitrogen, phosphorus and potassium. Within the plant, it functions in the transportation of starch in metabolic processes, in formation of the cell wall and in the stiffening of stems. Calcium may function in the formation of the nucleuses and chloroplasts, and it possibly aids magnesium, potassium and boron in the part these elements play in plant growth.

Iron, magnesium and sulphur are usually present in sufficient quantities in the average soil, but may become unavailable because of certain soil reactions. Iron is essential for the development of the green coloring matter, chlorophyll, in the leaves, without which there would be no food manufactured. It is said to be beneficial to the growth of some fungi and may promote the fixation of atmospheric nitrogen by soil bacteria. Iron is unavailable in alkaline soil or where phosphorus is present in excess amounts.

Magnesium functions in the formation of seeds, nucleoproteids, cell division and chlorophyll and in transportation of phosphates. It facilitates the assimilation of sulphur and nitrogen. Sulphur is a constituent of an amino acid. In the soil it is found in combination with ammonium, calcium and potassium ions in the form of sulphates.

Boron, manganese, copper and zinc are considered as minor, or trace elements. They may be as essential to the well-being of the plant as the other elements discussed, but such small amounts are necessary that they are not generally limiting. The function of boron in the plant is not clearly understood. Recently it has been stated that it regulates the water relations of the plasma colloids and that it is concerned in carbohydrate transportation and utilization. In this function it appears to be closely associated with calcium. The role of manganese appears to be catalytic. It functions in chlorophyll formation and is possibly related in some way to flower production. Boron and manganese deficiencies most often occur in alkaline soils. Little is known relative to the essential nature of copper, but it is reported to be necessary for all or most growth phases. Some workers have reported a specific effect of copper on seed production. Deficiencies of copper occur most often in soil high in organic matter, such as peats and mucks. The role of zinc in the plant is, likewise, not clearly understood. Reports have shown that it is effective in correcting such physiological disorders as little leaf and rosette in some plants, but how it acts as a corrective is not known.

Several other elements have, from time to time, been reported to show stimulative effects on plant growth, but their necessity for growth is not definitely assured. Among these are chlorine, silicon, sodium and molybdenum.

Deficiency Symptoms.

Diagnosis of unsatisfactory growth condition is not an easy matter. Abnormal growth may be due to various causes, such as climatic conditions, insect and disease troubles, injury from spray material, soil conditions, including poor drainage, insufficient aeration and lack of essential nutrients, mechanical injuries and others. Diagnosis becomes a matter of logical procedure in the elimination of the factors responsible for poor growth. To one familiar with the normal growth habit and characteristics of the tree or plant in question, and a thorough knowledge is essential, it often does not take long to determine the general cause of abnormal development. The more information the diagnostician has concerning cultural practices previously followed and other pertinent information, the easier the task becomes. Climatic and soil conditions are as a group more difficult to diagnose than insect and disease troubles.

Nutritional deficiencies are the most difficult to diagnose in the early stages of their development and become easier as the symptoms become more advanced. Since in advanced stages of nutrient deficiency, extensive injury to the plant may have occurred and considerable time is necessary to correct it, the importance of early diagnosis is apparent. A keen observer will be able to notice symptoms much sooner than one who is less observing or is not familiar with the characteristic growth of the plant.

Mineral elements may become deficient for a number of reasons. They may not be present in sufficient quantities to give adequate growth. Conditions may arise where an ample supply of an element may be present in the soil, but it is tied up in compounds not readily available to the plant. The quantities of mineral nutrients required cannot be easily placed on a mathematical basis. Environmental factors of light, temperature and moisture will affect growth, and the more vigorous the growth, the greater the amounts of nutrients required.

A certain balance between essential elements is necessary. A high nitrogen condition increases the demand on potassium. The use of nitrogen continuously may bring about a deficiency of potassium, although normally the amount would

be ample. High lime may bring about a deficiency of potassium, iron or manganese. A balanced relationship between some of the other elements is also necessary.

Foliage deficiency symptoms of the various elements are either apparent at the base or tip of the current season's growth. With nitrogen, phosphorus, potassium, magnesium and zinc, the symptoms are apparent on the older leaves; with iron, manganese, sulphur, calcium, boron and copper, the chlorosis, or breakdown, is first apparent on the young leaves. This difference in parts first affected is due to the relative mobility of the reserve supplies of these elements within the plant. With those that are readily mobile, foliage deficiencies are first apparent in the older leaves, while with those that are not readily mobile, the deficiencies show first in the young leaves.

The following chart and key to nutritional troubles are given with some hesitation, since there is so little information available on deficiency symptoms occurring in woody ornamental plants. A survey of the literature will show, however, that deficiency symptoms of several of the mineral elements show remarkably similar characteristics in a variety of plants, including truck crops, farm crops, tobacco, fruit trees and flowers. Perhaps woody ornamental plants can be added to this list. Observations indicate this to be the case with some of the elements. It should be understood, however, that it is doubtful if all the symptoms would be common to all plants.

The chart and key are not based on original experimental evidence, but on observation and a partial survey of the literature. Their greatest value may lie in stimulating interest in this field of research with woody ornamentals and to provide a guide for arborists, nurserymen and landscape gardeners in diagnosing mineral deficiencies under field conditions. Corrections and additions should be made as freely as experimental evidence and observations warrant. Presented is the incentive; in the near future it is hoped that verification and clarification of the symptoms, in ornamentals, will be forthcoming.

CHART OF PLANT NUTRIENT DEFICIENCY SYMPTOMS

It is important to stress that the first indications of most, if not all, deficiencies are such symptoms as less secondary thickening of the new shoots, fewer new breaks and retardation in growth rate of laterals and shoots. More advanced stages show the typical coloration, chlorosis, or breakdown of the leaf.

NITROGEN DEFICIENT

General

Nitrogen deficiency common in woody plants.

First indication of nitrogen deficiency is usually retardation in rate of growth of laterals, shoots and suckers and fewer new breaks.

Leaves

Following symptoms usually more pronounced on lower leaves of current season's growth:

Leaves uniformly yellowish or light green without any amount of darker green tissue adjacent to the veins. Leaves show no mottling.

New leaves small.

Presence of reddish veins and petioles.

Leaves borne in upright position, petioles forming narrow angle with stem.

Sometimes premature shedding of leaves.

Stems

Growth stunted as indicated under "General" above.

Stems slender, but stiff and woody and with few new breaks.

Reddish or purple cast to stems frequently present.

Terminal bud forms early.

NITROGEN EXCESS

General

Excess nitrogen may cause excessive vegetative growth with resulting smaller number of flower buds. Such plants will be soft and excessively succulent.

Where nitrogen is excessive and light within the plant poor, overly slender stems and thin leaves are often produced.

Leaves

Leaves large and dark green.

Later leaves may become puckered or crinkled.

Characteristic potassium deficiency symptoms may develop.

Stems

Excessive growth.

Many sucker shoots.

Maturity delayed.

Reduction of flower buds in proportion to leaf buds.

PHOSPHORUS DEFICIENCY

General

Frequency of phosphorus deficiency in woody ornamentals not known.

First symptoms of deficiency are retardation in rate of growth of shoots and development of fewer breaks.

Leaves

Following symptoms usually more pronounced on lower leaves of current season's growth:

Petioles and leaves purplish, particularly near tips of twigs.

Leaves dark, grayish or dull green, often leathery.

New leaves small.

Lower leaves on current season's growth become yellow between the veins or at the margins in cases of extreme deficiency. Leaves sometimes mottled.

Stems

Growth slender, usually short internodes.

Fewer stems.

Slow breaking of buds in the spring.

POTASSIUM DEFICIENCY

General

Deficiency common in woody plants, especially fruits, growing in sandy soils.

Important early symptoms include production of few new breaks and failure of laterals to develop normally.

Leaves

Following symptoms localized on older, lower leaves of current season's growth:

Leaves first show reddish-brown discoloration, mostly confined to marginal region.

Margins later become brownish-orange or purplish. Necrotic spots may appear near tips and margins.

Leaves finally become hard and brittle, with broken and ragged margins, exhibiting an ashy or purplish-gray color.

Leaves remain attached to stem even after considerable injury.

Stems

Total vegetative growth restricted.

The fewer growing shoots may be as long as usual under normal conditions.

CALCIUM DEFICIENCY

General

Not commonly deficient in woody ornamental plants.

Occurs in highly acid (pH 5.5 or below), sandy soils.

Root breakdown may precede or accompany foliage symptoms.

Leaves

Early stages of deficiency symptoms appear in young leaves.

Leaves nearly normal at first, later slightly yellow.

Young leaves sometimes hooked at tip and exhibit a rolled margin.

Breakdown appearing at tip and margin of young leaves. Sometimes breakdown limited to central portion of margin.

Stems

Terminal bud dies or remains inactive after early stages of deficiency.

Growth restricted and stunted.

Severe cases show dieback of stems.

MAGNESIUM DEFICIENCY

General

Magnesium deficiency quite common in woody plants. Symptoms usually do not appear before midsummer. Most often occurs in acid, sandy soils.

Leaves

Following symptoms localized on older, lower leaves of current season's growth:

Symptoms appear as yellowish-green, grayish-green or fawn-colored blotches.

Chlorosis progresses inward from margin.

Defoliation progresses from base to tip of current growth, leaves falling early.

New leaves small, thin and soft in texture.

Stems

General stunting, retardation in growth rate.

Dieback of twigs in severe cases.

ZINC DEFICIENCY

General

Deficiency probably not common with woody ornamentals.

Leaves

Following symptoms appearing in early stages on older leaves of current season's growth:

Leaves chlorotic, mottled or with white or yellowish streaks between the veins.

Typical little leaf or rosette of pecans

and fruits, mottle-leaf of citrus, yellows of walnut and crinkle-leaf of peach.

Leaves falling soon after deficiency symptoms appear.

Stems

Flower bud formation greatly reduced.

Twigs die back after first year.

Branchlets arising from below affected parts produce nearly normal leaves.

IRON DEFICIENCY

General

Common in many woody plants.

Occurs in soils of high pH (alkaline).

Leaves

Early stages of deficiency localized in young leaves at shoot tips.

Leaves chlorotic between the veins; larger veins remain green.

Leaves may become almost white.

Breakdown of tissues at margin or at irregular blotches.

Leaves from terminal buds are weak and small, appear tufted.

Stems

Chlorosis may show on single branch, part of tree or all of tree at one time.

Poor development of buds, but terminal bud remains alive until acute stage.

Severe cases result in branch dieback and a stag-headed condition.

MANGANESE DEFICIENCY

General

Most likely to occur on alkaline soils.

Leaves

Early stages of deficiency localized in young leaves at shoot tip.

Young leaves chlorotic, much the same as occurs with iron deficiency, but necrotic spots are found scattered over the whole leaf.

Small veins remain green, giving netted effect to leaves.

Stems

Growth weak.

Terminal bud remaining alive until acute stage.

Dieback in severe cases.

SULPHUR DEFICIENCY

General

Little is known concerning the prevalence of sulphur deficiency with woody plants.

Leaves

Early stages of deficiency symptoms localized in young leaves on shoot tips.

Young leaves chlorotic throughout, or with the veins lighter than adjoining interveinal areas.

Little necrosis or breakdown.

Stems

Stems thin, less succulent than normal and stunted.

Terminal bud remaining alive until acute stage is reached.

COPPER DEFICIENCY

General

Most often occurs in peat and muck soils.

Deficiency probably not common with woody ornamentals.

Leaves

Early stages of deficiency symptoms appearing in young leaves.

Leaves at first dark or bluish-green, later show some chlorosis or a bleached appearance.

Leaves wilt easily.

Stems

Terminal buds remain alive until late stages, when some dieback may appear.

BORON DEFICIENCY

General

Probably not often important in woody ornamental plants.

Several troubles, such as cork and drought spot and measles of fruits, browning of cauliflower and cracking of stems of celery, seem to be due to boron deficiency.

Leaves

Early stages of deficiency symptoms appear in young leaves.

Leaves yellowish-green at base followed by breakdown.

Dwarf, thickened, brittle leaves arise from nodes.

Internodes short, giving rosette or witches'-broom effect.

Stems

Buds often fail to develop in the spring.

Terminal bud dies early, followed by dieback of twig by midsummer.

Stems brittle.

Dark green water-soaked spots appear near tip of the twig. Sometimes fluxing from these spots.

Premature defoliation.

KEY TO PLANT NUTRIENT DEFICIENCY SYMPTOMS AS MAY APPLY TO WOODY PLANTS

The very early symptoms, such as fewer new breaks and retarded growth, cannot be readily keyed out, since they are more or less common to all deficiencies. The following key to the more advanced stages may be helpful:

1. Symptoms which, in the early stages of deficiency, tend to be localized in the older leaves of the current season's growth or are more or less general on whole shoot.
2. Symptoms rather generally distributed over whole extent of current season's growth, but usually more pronounced on lower leaves of current season's growth. No necrotic or dead spots on foliage except in advanced stages of development.
3. Leaves uniformly yellowish or light green. Petiole forming narrow angle with stem, causing leaves to be borne in more upright position. Veins and petioles reddish.
—*Nitrogen deficient*

3. Younger leaves on current growth dark green, but duller than normal. Older leaves become yellow or slightly mottled between the veins. Young twigs, petioles and often main veins show abnormal amounts of purplish-red color.
—*Phosphorus deficient*

2. Symptoms localized on older, lower leaves of current season's growth. Leaves are chlorotic or mottled and may or may not show necrotic or dead spots.
4. Leaves remaining attached to the twig even after considerable marginal scorching and breakdown. Early symptoms appear as purplish or olive-brown margins. In some plants margin becomes yellow instead of purple. Later these become reddish or grayish-brown, giving a scorched margin. This breakdown may extend inward toward midrib of the leaf. Leaves become brittle and break up at the margin. Necrotic areas bordered by purplish or green tissue, not yellow.
—*Potassium deficient*

4. Leaves usually falling soon after deficiency symptoms are apparent. Dropping progresses from base to tip of current season's shoots.
5. Early symptoms appear as yellowish-green, grayish-green or fawn-colored blotches between the veins or near the margin of the leaves. The veins and tissues adjoining remain green. Symptoms usually not appearing until midsummer. The yellowish blotches finally become brown in color, typical of breakdown. Brown necrotic areas bordered by narrow region of light green to yellow-green tissue. —*Magnesium deficient*

5. Early symptoms appear as rosettes of small narrow chlorotic, mottled or white-streaked leaves at tips of current season's shoots. These symptoms are usually preceded by dropping of leaves from bases of current shoots. Symptoms appear in the spring. —*Zinc deficient*

1. Symptoms which, in the early stages of deficiency, tend to be localized in young leaves at the terminals of current season's shoots.
6. Terminal buds remain alive until late or severe stages of deficiency develop.
7. Leaves chlorotic or yellow in early stages of deficiency, with no indication of permanent wilting of new growth.
8. Leaves chlorotic or yellow between the veins, the veins remaining green.
9. Only larger veins remain green. Necrosis or breakdown does not occur until advanced stages of deficiency. Leaves may be nearly white in color. In advanced stages there is breakdown of tissues at margins or inward toward the midrib. Dieback finally occurs. —*Iron deficient*

9. Small veins remain green, giving netted appearance to leaves. Necrotic areas soon found scattered over whole leaf blade.
—*Manganese deficient*

8. Leaves more or less uniformly chlorotic or light green in color, or the veins lighter than adjoining interveinal area. Few, if any, necrotic areas appear. —*Sulphur deficient*

7. Leaves remain normal or darker green in color in first stages of deficiency. In acute stages, the interveinal area may become chlorotic or show a bleached appearance. Young leaves lack firmness and exhibit wilted condition.
—*Copper deficient*

6. Terminal bud dies or shows no further development after early stages of deficiency.
10. Leaves nearly normal or only slightly yellow in color in early stages of deficiency. Later leaves may become hooked at tip and rolled at the margin. This is followed by browning and breakdown at the tip and margin of leaf. Margin breakdown may be limited to central portion. Later breakdown may extend inward toward center of leaf.
—*Calcium deficient*

10. Leaves chlorotic, sometimes only near the base. Later become brittle, and breakdown develops. Young stems become brittle. —*Boron deficient*

Ornamental Crab Apples

As this is the time of year when the fruits of the crab apples color brilliantly, the September 17 issue of Arnoldia, a continuation of the bulletin of popular information of the Arnold Arboretum, carries comments on their ornamental value. Some varieties are outstanding, states the bulletin, retaining their colorful fruits for long periods; others are mediocre in this respect, and still others have fruits that remain green until they fall from the trees. Some of the crab apples we value for their beautiful flowers alone, such as the double-flowering varieties of Malus ioensis, M. halliana parkmani, M. hupensis, Katherine and Prince Georges, the last two of which are new double-flowering varieties. However, these do not have brilliantly colored fruits. In a few forms, such as Bob White, the small fruits remain on the trees throughout the winter, and these supply a source of food for certain winter birds.

Then there are some like Beauty, Bob White, Malus brevipes and M. toringoides which are valued for their colored fruits, but which are not especially prominent in flower when compared with the better flowerng varieties. The best of these useful trees, however, is that group which includes the species and varieties noted for both colorful flowers and fruits, such as M. arnoldiana, M. baccata, Flame, M. floribunda, Hopa, Joan, Montreal Beauty, the M. purpurea varieties aldenhamensis, eleyi and lemoinei; Redflesh, M. robusta persicifolia, Sissipuk and M. zumi calocarpa.

In many old orchards one used to find certain crab apple trees grown for economic purposes, chiefly for making preserves and jellies. Hyslop, Transcendent and Whitney are probably the best of these, but Florence and Early Strawberry are available from one or two nurseries in this country.

Newer varieties of economically valuable crab apples are becoming available through a few nurseries in the United States and Canada. Among these varieties, some of which are ornamental as well as useful, are Bedford, Columbia, Dolgo, Osman, Rosilda, Scugog, Wynema and Young America. Some of these are grown for their fruits in place of standard apple varieties in the colder parts of Canada where ordinary apples are not hardy.

The length of time that the species and varieties retain their colorful fruits on the trees is of great interest, and a chart accompanying the foregoing notes shows some of the data collected in the Arnold Arboretum last year. The length of time the fruit remains colorful may vary from year to year, but the data in the chart represent the normal fruiting season of 1942 and are reprinted from "Crab Apples for America," recently published by the American Association of Botanical Gardens and Arboretums.

RENAME CRAB APPLE.

One of the most attractive of the new ornamental crab apples introduced by the New York experiment station, at Geneva, in the 1930's under the name of Geneva has been renamed Van Eseltine in honor of the late Glen P. Van Eseltine, station botanist, who developed the new variety.

This change was announced recently by Prof. Richard Wellington, station pomologist, with the explanation that the Canadian experiment station, at Ottawa, introduced a Geneva crab apple a number of years ago. Since that variety is still in existence, it was deemed wise to change the name of the second Geneva to Van Eseltine.

The Van Eseltine is described as a strikingly beautiful ornamental. Professor Van Eseltine made the cross in 1930 in the course of his studies on the botany of the apple, using the Arnold and the Chinese flowering crab apples as parents. The tree of the Van Eseltine is medium tall and is larger and more upright in growth than that of the Arnold crab apple. The foliage is abundant and the blossoms are semidouble and remind one of a flowering cherry. The flowers are bell-shaped before fully expanding and are a deep pink in color. The tiny fruits resemble those of Arnold and are borne in abundance.

As in the case of all new fruit varieties developed at the New York experiment station, stocks of the Van Eseltine crab apple have been propagated and distributed by the New York State Fruit Testing Cooperative Association, at Geneva.

L. C. Ihrke

IHRKE RETURNS TO HILL'S.

L. C. "Jens" Ihrke has again become associated with the D. Hill Nursery Co., of Dundee, Ill., in the capacity of sales representative, calling on the wholesale trade.

Mr. Ihrke received his training in the nursery business at Hill's, being employed there from 1924 to 1933. Since that time he has made a wide acquaintance throughout the trade, having traveled in seventeen states. He is now greeting his acquaintances, representing the firm by whom he was formerly employed.

He will continue to make his residence in Iowa, but will spend his time contacting customers throughout the middle west.

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Late Summer and Fall in Hardy Border

By C. W. Wood

Continuing our inquiry commenced in the preceding issue regarding plants for late summer and autumn bloom, let us now turn our attention from the rock garden to the border. It will be remembered that, despite the general supposition that little color is available in the rock garden at this late season, we found not a few plants of easy culture to fill our wants. It appears that many gardeners also have the opinion that few border plants bloom in autumn, but in fact we shall see that there is much good material whose blooming period falls between late August and the coming of snow.

First, however, let us discuss a few landscape problems which have a special bearing on the autumn garden. This is the season of bright colors. Many gardeners express displeasure, for instance, at the lively shades when they come in spring or early summer. Observe them now, however, and you will likely see them welcoming all the colors, especially purples and scarlets and even magenta, which they detested earlier, in the most unlikely associations. It is true that most magenta haters have to be shown before they will ascribe any virtue to magenta, but the hatred can be overcome by example. A frequent visitor to this nursery—a woman of no mean achievements as a gardener—often showed her displeasure at magenta until she came one early September day and saw a wide spread of Callirhoe involucrata (anathema to all aesthetic souls!) growing among the blue of Caryopteris mongoliensis. Although it took several visits to convince her that magenta could be used in pleasing associations, prejudice was finally overcome to the point of a good order. I am firmly convinced that most prejudices against certain colors can be overcome by the same method.

There is no doubt some justification for the popular belief that red and yellow do not combine well. I have not a little feeling that way myself during the hot days of summer, but when autumn comes that feeling is entirely absent. And I believe that most others react in a similar manner. As an example, I might say that, until the advent of a pure yellow, I had little liking for gaillardias. They were well enough in the autumn, but during the summer their harsh shades introduced a jarring effect in practically all associations. On the other hand, when the garden is sinking to rest, not only gaillardias, but other combinations of red and yellow, such as kniphofias planted in front of heleniums and Lobelia cardinalis, give close association with a soft yellow helenium.

Much more could be said about the landscape problems, especially color associations, of the autumn garden, but we must hasten on to an enumeration of the plants or there will be little room left for them. Perhaps a few words may be crowded into the discussion of the problem children when they turn up.

Generally speaking, the heleniums are perhaps the most useful of all autumn flowers. I say that in the face of the fact that Michaelmas daisies are more popular than the sneezeweeds. I shall not go into the matter of preference, except to say that the problem of upkeep, including removal of blooms before they scatter seeds to the four corners of the map or the subsequent weeding out of self-sown seedlings, is a frequent criticism against asters heard by visitors here. Be that as it may, heleniums are becoming, with the introduction of modern varieties, more popular from year to year, according to my observation. It is now possible to have heleniums in bloom from June until frost, commencing with the new hybrids in the early part of the season and ending with the tall-growing kinds in late autumn. Among the early bloomers, I have found the bright orange-yellow of Chippersfield Orange, the brown-red of Moerheim Beauty and the golden-yellow of Madam Canivet of special value, while the soft gold of Gartensonne and the old gold of Riverton Gem are pleasing in the late garden.

Despite mildew and other diseases to which fall asters are an easy prey, they continue to be one of our most popular fall flowers. They are, however, too well known to need extended comment here. And as they have been quite fully discussed in this department during the past year, varietal problems need not be brought up again.

I often wonder why kniphofias are as popular as they are when I see how they are misused in landscape work. Come to think of it, though, I am probably wrong when I insist that they should have some sort of foil and those gardeners are right who insist on putting them in isolated groups on the lawn. I have a notion, however, that more of the plants would be sold in neighborhood nurseries if the nurseryman's grounds showed how lovely they can be in association with certain other plants of their season. For instance, allow the great orange-scarlet of Kniphofia pfitzeri to pierce the white clouds of Aster Mount Ranier and the blue of Blue Plume. Or again, plant a kniphofia whose predominating shade is primrose or pale yellow with one of the dark blue monkshoods for an exciting autumn picture. Enough has been said, I think, to make it plain that kniphofias are capable of wide use in the landscape, other than their usual employment as isolated specimens.

Several good blue flowers are ready to answer our call for the autumn garden. Of these, monkshoods are no doubt of greatest value, if one has a soil to their liking. I have trouble making them thrive in my light soil, even with the utmost care, but friends with gardens on clay have no trouble at all. I remember with a great deal of pleasure a planting of Aconitum wilsoni and Aster Harrington's Pink which I saw last fall. It not only gave me much pleasure at the time, but has since suggested several associations of much potential beauty. Thus, I should expect the paler blue flowers of A. fischeri and any of the pink asters or either of the monkshoods mentioned and vernonia to make pleasing pictures in the autumn garden.

Salvia azurea grandiflora, in addition to being one of the grandest flowers of the entire year, adds a touch to the fall landscape which is available from no other source that I know. Its beautiful sky-blue flowers, large for a sage, give it distinction in any company; its ease of culture in any sunny well drained spot gives it value to the casual gardener, and an almost ironclad hardiness (at least in material from the northern part of its range) fits it for a role in gardens throughout most of the country. Try it in association with pale yellow or soft pink for charming fall pictures.

The blue flowers of the autumn border would not be complete with-

STOCK FOR IMMEDIATE DELIVERY

We offer the following list of first-class nursery stock in both finished and lining-out stock for immediate delivery, subject to stock being unsold on receipt of orders. Terms and conditions same as published in our regular Trade List. Send your want list for quotations. Wholesale Fall Price List will be mailed this month.

HARDY DECIDUOUS FLOWERING SHRUBS

S.—Seedlings; C.—Rooted Cuttings; Tr.—Transplanted; Br.—Branched; L.O.—Lining Out; Div.—Divisions

	Per 10	Per 100	Per 1000
ACANTHOPANAX PENTAPHYLLUM. Five Leaf Aralia.			
18 to 24 ins., tr., well br...	$1.25	$10.00	.....
2 to 3 ft., tr., well br....	1.50	12.50	.....
3 to 4 ft., tr., well br....	2.50	20.00	.....
ALMOND, PRUNUS GLANDULOSA. Double Pink-flowering Almond, own root.			
18 to 24 ins., tr., well br...	$2.50	$20.00	.....
2 to 3 ft., tr., well br.....	3.00	25.00	.....
3 to 4 ft., tr., well br....	4.00	30.00	.....
ALTHAEA, HIBISCUS SYRIACUS. Shrub Althaea. Ardens—Double Violet.			
12 to 18 ins., tr.	$0.75	$ 6.00	.....
18 to 24 ins., tr.	.90	8.00	.....
2 to 3 ft., tr.	1.25	10.00	.....
3 to 4 ft., tr.	1.50	12.50	.....
BERBERIS THUNBERGI. Japanese Barberry.			
12 to 15 ins., s.	$0.30	$ 2.50	$20.00
15 to 18 ins., s.	.40	3.50	30.00
18 to 24 ins., s.	.60	5.00	40.00
BERBERIS THUNBERGI ATROPURPUREA. Redleaf Barberry.			
12 to 18 ins., tr.	$1.50	$10.00	.....
18 to 24 ins., tr.	2.00	15.00	.....
24 to 30 ins., tr.	2.50	20.00	.....
BERBERIS THUNBERGI ERECTA. Truehedge Columnberry. (Plant Patent No. 110)		5 each	25 each
12 to 15 ins.		$0.22	$0.18
15 to 18 ins.		.27	.22
18 to 24 ins.		.33	.28
24 to 30 ins.		.40	.35
BUDDLEIA DAVIDI MAGNIFICA. Butterfly Bush.	Per 10	Per 100	Per 1000
18 to 24 ins., c.	$1.00	$ 8.00	.....
2 to 3 ft., c.	1.25	10.00	.....
CALYCANTHUS FLORIDUS. Sweet Shrub.			
12 to 18 ins., s., br.	$0.80	$ 6.00	.....
18 to 24 ins., s., br.	1.25	10.00	.....
2 to 3 ft., s., br.	1.50	12.50	.....
CEANOTHUS AMERICANUS. Jersey Tea.			
12 to 18 ins., tr.	$1.25	$10.00	.....
18 to 24 ins., tr.	1.50	12.00	.....
2 to 3 ft., tr.	2.00	15.00	.....
CHIONANTHUS VIRGINICUS. White Fringe Tree.			
2 to 3 ft., tr.	$4.00	.....	.....
3 to 4 ft., tr.	5.00	.....	.....
4 to 5 ft., tr.	7.00	.....	.....
CORNUS AMOMUM. Silky Dogwood.			
12 to 18 ins., well br.....	$0.50	$ 4.00	$30.00
18 to 24 ins., well br.....	.70	6.00	50.00
2 to 3 ft., well br.....	1.00	8.00	90.00
CORNUS STOLONIFERA. Red Osier Dogwood.			
12 to 18 ins., tr.	$0.50	$ 4.00	$30.00
18 to 24 ins., tr.	.70	6.00	50.00
2 to 3 ft., tr.	1.00	8.00	90.00
CYDONIA JAPONICA RUBRA. Japanese Quince. True Upright Red. Nonfruiting.			
12 to 18 ins., tr.	$1.50	$12.00	.....
18 to 24 ins., tr.	2.50	20.00	.....
2 to 3 ft., tr.	3.00	25.00	.....
DEUTZIA SCABRA. Varieties: Candidissima Florepleno—Double White. Crenata—Double Pink. Pride of Rochester—Double Rose.			
12 to 18 ins., well br.....	$0.50	$ 4.50	$40.00
18 to 24 ins., well br.....	.80	7.00	60.00
2 to 3 ft., well br.....	1.00	9.00	80.00
3 to 4 ft., well br.....	1.50	12.00	.....
FORSYTHIA FORTUNEI. Fortune Forsythia.			
FORSYTHIA INTERMEDIA. Border Forsythia.			
FORSYTHIA SIEBOLDI. Upright Forsythia.			
FORSYTHIA VIRIDISSIMA. Green-stem Forsythia.			
12 to 18 ins., well br.....	$0.60	$ 5.00	$40.00
18 to 24 ins., well br.....	.80	7.00	60.00
2 to 3 ft., well br.....	1.25	10.00	90.00
3 to 4 ft., well br.....	2.00	15.00	120.00
HAMAMELIS VIRGINIANA. Witch Hazel.			
2 to 3 ft., tr.	$1.50	$12.50	.....
3 to 4 ft., tr.	2.50	20.00	.....
4 to 5 ft., tr.	3.50	30.00	.....
LAGERSTROEMIA INDICA. Crape Myrtle. Varieties: Alba—White. Rosea—Pink. Rubra—Red.			
2 to 3 ft., tr.	$3.00	$25.00	.....
3 to 4 ft., tr.	4.00	35.00	.....
4 to 5 ft., tr.	5.00	40.00	.....
LIGUSTRUM OBTUSIFOLIUM. Ibota Privet.			
12 to 18 ins., 2 br. up.....	$0.35	$ 2.50	$20.00
18 to 24 ins., 3 br. up.....	.45	3.50	30.00
2 to 3 ft., 4 br. up.....	.60	5.00	45.00
3 to 4 ft., 4 br. up.....	.80	7.00	.....
LIGUSTRUM OVALIFOLIUM. California Privet. Grafting Grade.			
12 to 18 ins., 3 br. up.....	$0.40	$ 3.50	$30.00
18 to 24 ins., 3 br. up.....	.50	4.50	40.00
2 to 3 ft., 4 br. up.....	.70	6.00	50.00
LIGUSTRUM SINENSE. South Privet.			
12 to 18 ins., br., c.....	$0.20	$ 1.50	$12.00
18 to 24 ins., br., c.....	.30	2.50	20.00
2 to 3 ft., br., c.....	.35	3.00	25.00
12 to 18 ins., tr., well br...	.30	2.50	20.00
2 to 3 ft., tr., well br.....	.50	4.50	40.00
LIGUSTRUM VULGARE, European Privet.			
18 to 24 ins., c., 3 br. up...	$0.50	$ 4.00	$35.00
2 to 3 ft., c., 4 br. up....	.60	5.00	45.00
LONICERA BELLA ALBIDA. White Belle Honeysuckle.			
12 to 18 ins., hedging	$0.50	$ 4.00	$35.00
18 to 24 ins., hedging	.60	5.00	45.00
LONICERA FRAGRANTISSIMA. Winter Honeysuckle.			
12 to 18 ins., 2-yr., 3 br. up	$0.45	$ 4.00	$35.00
18 to 24 ins., 2-yr., 3 br. up	.70	6.00	50.00
LONICERA MORROWI. Morrow's Honeysuckle.			
LONICERA TATARICA. Tatarian Honeysuckle. Varieties of Tatarian: Alba—White. Rosea—Pink. Rubra—Red.			
12 to 18 ins., hedging	$0.50	$ 4.00	$35.00
18 to 24 ins., hedging	.60	5.00	45.00
18 to 24 ins., well br.....	1.00	8.00	75.00
2 to 3 ft., well br.....	1.50	12.00	.....
PHILADELPHUS MONT BLANC.			
PHILADELPHUS NIVALIS. Snowbank Mock Orange.			
18 to 24 ins., well br.....	$1.25	$10.00	.....
2 to 3 ft., well br.....	1.50	12.00	.....
RHUS CANADENIS (Aromatica). Fragrant Sumac.			
2 to 3 ft., tr.	$2.00	$15.00	.....
3 to 4 ft., tr.	2.50	20.00	.....
4 to 5 ft., tr.	3.00	25.00	.....
SPIRAEA ARGUTA. Garland Spiraea.			
12 to 18 ins., hedging	$0.70	$ 6.00	$50.00
18 to 24 ins., hedging	.90	7.00	60.00
12 to 18 ins., 2-yr., tr.....	1.00	8.00	.....
18 to 24 ins., 2-yr., tr.....	1.25	10.00	.....
2 to 3 ft., 2-yr., tr.....	1.50	12.00	.....
3 to 4 ft., 2-yr., tr.....	2.00	15.00	.....
SPIRAEA PRUNIFOLIA. Bridal Wreath.			
18 to 24 ins., tr.	$2.50	$20.00	.....
2 to 3 ft., tr.	3.00	25.00	.....
3 to 4 ft., tr.	3.50	30.00	.....
SPIRAEA THUNBERGI. Thunberg's Spiraea.			
12 to 18 ins., hedging	$0.70	$ 6.00	$50.00
18 to 24 ins., hedging	.90	7.00	60.00
12 to 18 ins., 2-yr., tr.....	1.00	8.00	.....
18 to 24 ins., 2-yr., tr.....	1.25	10.00	.....
2 to 3 ft., 2-yr., tr.....	1.50	12.00	.....
3 to 4 ft., 2-yr., tr.....	2.00	15.00	.....
SPIRAEA VANHOUTTEI.			
12 to 18 ins., hedging	$0.55	$ 4.00	$45.00
18 to 24 ins., hedging	.65	5.50	50.00
2 to 3 ft., hedging	.80	7.00	60.00
18 to 24 ins., well br.....	1.00	8.00	70.00
2 to 3 ft., well br., clumps	1.25	10.00	.....
3 to 4 ft., well br., clumps	2.00	15.00	.....
4 to 5 ft., well br., clumps	2.50	20.00	.....
WEIGELA. Varieties: Amabilis—Light Pink. Hendersoni—Dark Pink. Rosea—Pink.			
12 to 18 ins., well br.....	$0.80	$ 6.00	.....
18 to 24 ins., well br.....	1.00	8.00	.....
2 to 3 ft., well br.....	1.25	10.00	.....

FOREST AND SHADE TREES

	Per 10	Per 100	Per 1000
ACER DASYCARPUM. Silver Maple.			
3 to 4 ft., s.	$0.40	$ 3.00	$25.00
4 to 5 ft., s.	.60	5.00	40.00
4 to 5 ft., tr., br.	2.00	15.00	.....
5 to 6 ft., tr., br.	2.25	17.50	.....
1¼ to 1½-in. caliper	6.50	.....	.....
ACER RUBRUM. Scarlet Maple.			
5 to 6 ft., tr.	$ 6.00	$50.00	.....
6 to 8 ft., tr.	8.00	70.00	.....
8 to 10 ft., tr.	10.00	90.00	.....
ALBIZZIA JULIBRISSIN. Mimosa Tree.			
4 to 5 ft., tr.	$ 5.00	$45.00	.....
5 to 6 ft., tr.	8.00	70.00	.....
6 to 8 ft., tr.	10.00	90.00	.....
8 to 10 ft., tr.	12.50	.....	.....
AMELANCHIER CANADENSIS. Downy Shad-blow.			
18 to 24 ins., tr.	$3.00	$20.00	.....
2 to 3 ft., tr.	4.00	30.00	.....
3 to 4 ft., tr.	5.00	40.00	.....
4 to 5 ft., tr.	6.00	.....	.....
CATALPA BUNGEI.			
3 to 4 ft.	$4.00	$30.00	.....
4 to 5 ft.	6.00	50.00	.....
5 to 6 ft.	7.50	65.00	.....
CATALPA SPECIOSA. Western Catalpa.			
4 to 5 ft., tr., br.....	$1.25	$10.00	.....
5 to 6 ft., tr., br.....	1.50	12.50	.....
6 to 8 ft., tr., br.....	2.00	15.00	.....
CERCIS CANADENSIS. American Redbud.			
3 to 4 ft., tr.	$ 2.50	$20.00	.....
4 to 5 ft., tr.	3.50	30.00	.....
5 to 6 ft., tr.	4.50	40.00	.....
6 to 8 ft., tr.	6.50	60.00	.....
8 to 10 ft., tr.	10.00	90.00	.....
CORNUS FLORIDA ALBA. Double White Dogwood.			
4 to 5 ft., tr., bare root.	$17.50	.....	.....
4 to 5 ft., tr., B&B	20.00	.....	.....
CORNUS FLORIDA. White-flowering Dogwood.			
3 to 4 ft., tr., br.....	$ 4.00	$35.00	.....
4 to 5 ft., tr., br.....	6.50	60.00	.....
5 to 6 ft., tr., br.....	10.00	80.00	.....
6 to 8 ft., tr., br.....	12.50	100.00	.....
8 to 10 ft., tr., br.....	15.00	125.00	.....
CORNUS FLORIDA RUBRA. Pink-flowering Dogwood.			
4 to 5 ft., B&B	$20.00	$175.00	.....
5 to 6 ft., bare root	20.00	175.00	.....
5 to 6 ft., B&B	25.00	225.00	.....
6 to 8 ft., bare root	25.00	.....	.....
6 to 8 ft., B&B	32.50	.....	.....
LIRIODENDRON TULIPIFERA. Tulip Tree.			
4 to 5 ft., tr.	$ 3.50	$30.00	.....
5 to 6 ft., tr.	4.50	40.00	.....
6 to 8 ft., tr.	6.50	60.00	.....
8 to 10 ft., tr.	8.50	80.00	.....
1½ to 2-in. caliper	15.00	120.00	.....

(Cost of B&B to be added.)

out the lovely little leadwort, Ceratostigma plumbaginoides or Plumbago larpentae, according to your botanical leaning. It was discussed in the installment of fall rock plants. It should be remarked, however, that it is equally at home in the front of the border, so long as the soil is light and well drained. Put it in front of the dwarf Aster Daphne or the white Snowsprite to see what it is capable of as a landscape plant.

The hardy chrysanthemums, though among the most important of fall flowers, are quite beyond the range of our present inquiry. That is true, not because of any difficulty of culture, but rather that the subject is so complicated by periods of flowering, degrees of hardiness and

FOREST AND SHADE TREES—CONTINUED

	Per 10	Per 100	Per 1000
MAGNOLIA TRIPETALA. Umbrella Magnolia.			
3 to 4 ft., tr., br.	$3.50	$30.00	.....
4 to 5 ft., tr., br.	4.50	40.00	.....
5 to 6 ft., tr., br.	5.50	50.00	.....
6 to 8 ft., tr., br.	7.00	60.00	.....
PLATANUS OCCIDENTALIS. American Plane Tree.			
4 to 5 ft., tr.	$ 5.00	.....	.....
8 to 10 ft., tr.	8.00	.....	.....
1¼ to 1½-in. caliper	10.00	.....	.....
1½ to 2-in. caliper	15.00	.....	.....

	Per 10	Per 100	Per 1000
POPULUS NIGRA ITALICA. Lombardy Poplar.			
5 to 6 ft., tr.	$2.25	$15.00	.....
6 to 8 ft., tr.	3.00	25.00	.....
8 to 10 ft., tr.	3.50	30.00	.....
SORBUS AUCUPARIA. European Mountain Ash.			
4 to 5 ft.	$ 6.00	.....	.....
5 to 6 ft.	8.00	.....	.....
6 to 8 ft.	10.00	.....	.....

	Per 10	Per 100	Per 1000
ULMUS AMERICANA. American Elm.			
5 to 6 ft., tr.	$3.50	$30.00	.....
6 to 8 ft., tr.	6.00	50.00	.....
8 to 10 ft., tr.	6.50	60.00	.....
ULMUS PUMILA. Chinese Elm.			
4 to 5 ft., s., br.	$0.60	$ 5.00	$40.00
5 to 6 ft., s., br.	.70	6.00	55.00
5 to 6 ft., tr.	5.00	35.00	.....
6 to 8 ft., tr.	6.00	50.00	.....
8 to 10 ft., tr.	7.00	60.00	.....

VINES AND CREEPERS

	Per 10	Per 100	Per 1000
CELASTRUS SCANDENS. American Bittersweet.			
12 to 18 ins., tr., br.	$0.55	$ 4.50	$40.00
18 to 24 ins., tr., br.	.65	5.50	50.00
2 to 3 ft., tr., br.	.75	6.50	60.00

	Per 10	Per 100	Per 1000
LONICERA JAPONICA HALLIANA. Hall's Japanese Honeysuckle.			
2-yr., tr., No. 1	$0.65	$ 5.50	$50.00
2-yr., tr., No. 2	.55	4.50	40.00
2-yr., tr., No. 3	.45	3.50	30.00

	Per 10	Per 100	Per 1000
WISTARIA CHINENSIS BLUE. Seedling Type.			
WISTARIA CHINENSIS WHITE. Seedling Type.			
WISTARIA FRUTESCENS. American Wistaria.			
2 to 3 ft., 2-yr.	$1.25	$10.00	$80.00
18 to 24 ins., 2-yr.	.65	5.50	50.00
12 to 18 ins., 2-yr.	.60	5.00	45.00

EVERGREENS CONIFERS

These prices include balling and burlapping.

	Per Each	Per 10
ARBORVITAE. Thuja.		
—OCCIDENTALIS GLOBOSA. Globe Arborvitae.		
15 to 18 ins.	$1.00	$ 8.50
18 to 24 ins.	1.15	10.00
—OCCIDENTALIS PYRAMIDALIS. American Pyramid.		
2 to 3 ft.	$1.15	$10.00
3 to 4 ft.	1.50	12.50
—ORIENTALIS AUREA NANA. Berckmans Golden (Biota).		
15 to 18 ins.	$1.10	$10.00
18 to 24 ins.	1.35	12.50
24 to 30 ins.	1.65	15.00
—ORIENTALIS BAKERI. Baker's Arborvitae (Biota).		
24 to 30 ins.	$1.00	$ 8.50
30 to 36 ins.	1.10	10.00
3 to 4 ft.	1.40	12.50
—ORIENTALIS BIOTA BONITA.		
15 to 18 ins.	$1.00	$ 8.50
18 to 24 ins.	1.15	10.00
24 to 30 ins.	1.50	12.50
—ORIENTALIS COMPACTA. Compact Arborvitae (Biota).		
18 to 24 ins.	$1.00	$ 9.00
24 to 30 ins.	1.25	11.00
30 to 36 ins.	1.40	12.50
—ORIENTALIS EXCELSA. Biota Excelsa.		
24 to 30 ins.	$1.00	$ 8.50
30 to 36 ins.	1.25	10.00
3 to 4 ft.	1.50	12.50
JUNIPERUS CHINENSIS COLUMNARIS. Column Chinese Juniper.		
24 to 30 ins.	$1.35	$12.50
30 to 36 ins.	1.60	15.00
3 to 4 ft.	2.00	17.50
4 to 5 ft.	2.50	22.50
JUNIPERUS CHINENSIS PFITZERIANA AUREA. Hill's Golden Pfitzeriana.		
15 to 18 ins.	$1.10	$10.00
18 to 24 ins.	1.35	12.50
24 to 30 ins.	1.65	15.00

	Per Each	Per 10
JUNIPERUS CHINENSIS PFITZERIANA. Pfitzer's Juniper.		
15 to 18 ins.	$1.10	$10.00
18 to 24 ins.	1.35	12.50
24 to 30 ins.	1.65	15.00
30 to 36 ins.	2.00	17.50
JUNIPERUS COMMUNIS ASHFORDI. Ashford Juniper.		
24 to 30 ins.	$1.00	$ 8.50
30 to 36 ins.	1.25	10.00
3 to 4 ft.	1.50	12.50
JUNIPERUS COMMUNIS CANADENSIS (Vase Shape). Silvery-green foliage.		
15 to 18 ins.	$0.60	$ 4.50
18 to 24 ins.	.75	6.00
24 to 30 ins.	.90	7.50
30 to 36 ins.	1.20	10.00
JUNIPERUS COMMUNIS DEPRESSA PLUMOSA. Andorra Juniper.		
15 to 18 ins.	$0.85	$ 7.00
18 to 24 ins.	1.00	8.50
24 to 30 ins.	1.15	10.00
30 to 36 ins.	1.40	12.50
JUNIPERUS COMMUNIS HIBERNICA. Irish Juniper.		
24 to 30 ins.	$0.90	$ 8.00
30 to 36 ins.	1.10	10.00
3 to 4 ft.	1.35	12.50
JUNIPERUS SQUAMATA MEYERI. Meyer's Juniper.		
12 to 15 ins.	$1.15	$10.00
15 to 18 ins.	1.40	12.50
18 to 24 ins.	1.65	15.00
JUNIPERUS VIRGINIANA BURKI. Burk Juniper.		
24 to 30 ins.	$1.65	$15.00
30 to 36 ins.	2.25	20.00
3 to 4 ft.	3.00	25.00
JUNIPERUS VIRGINIANA CANAERTI. Canaert's Red Cedar.		
30 to 36 ins.	$2.00	$17.50
3 to 4 ft.	2.25	20.00
4 to 5 ft.	3.25	30.00

	Per Each	Per 10 Blue
JUNIPERUS VIRGINIANA GLAUCA. Cedar.		
24 to 30 ins.	$1.65	$15.00
30 to 36 ins.	2.25	20.00
3 to 4 ft.	3.00	25.00
JUNIPERUS VIRGINIANA GLOBOSA. Globe Juniper.		
12 to 15 ins.	$1.00	$ 8.50
15 to 18 ins.	1.15	10.00
18 to 24 ins.	1.40	12.50
JUNIPERUS VIRGINIANA KETELEERI. Keteleer's Juniper.		
30 to 36 ins.	$2.00	$17.50
3 to 4 ft.	3.00	25.00
4 to 5 ft.	3.50	30.00
JUNIPERUS VIRGINIANA SMITHI. Smith Red Cedar.		
24 to 30 ins.	$1.35	$12.50
30 to 36 ins.	1.60	15.00
3 to 4 ft.	2.25	20.00
RETINOSPORA FILIFERA. Thread Retinospora.		
18 to 24 ins.	$0.80	$ 6.50
2 to 3 ft.	1.00	8.50
RETINOSPORA PISIFERA.		
RETINOSPORA SQUARROSA VEITCHI. Blue Moss Color.		
18 to 24 ins.	$0.80	$ 6.50
2 to 3 ft.	1.00	8.50
3 to 4 ft.	1.25	10.00
RETINOSPORA PLUMOSA. Green Retinospora.		
RETINOSPORA PLUMOSA AUREA. Golden Plume Retinospora.		
24 to 30 ins.	$1.00	$ 9.00
30 to 36 ins.	1.15	10.00
3 to 4 ft.	1.40	12.50
TSUGA CANADENSIS. Canadian Hemlock.		
24 to 30 ins.	$1.75	$15.00
30 to 36 ins.	2.00	17.50
3 to 4 ft.	3.00	25.00

BROADLEAF EVERGREENS

These prices include balling and burlapping except where noted.

BR.—denotes bare root.

	Per Each	Per 10	Per 100
ABELIA GRANDIFLORA. Glossy Abelia.			
18 to 24 ins., BR.	$0.30	$ 2.25	$20.00
2 to 3 ft., BR.	.40	3.25	30.00
3 to 4 ft., BR.	.55	5.00	45.00
ELAEAGNUS FRUITLANDI.			
2 to 3 ft.	$1.25	$10.00	.....
3 to 4 ft.	1.50	12.00	.....
ELAEAGNUS PUNGENS REFLEXA.			
2 to 3 ft.	$1.15	$ 9.00	.....
3 to 4 ft.	1.25	10.00	.....
EUONYMUS BUNGEANUS (Sieboldianus). Winterberry Euonymus.			
12 to 18 ins.	$0.75	$ 6.00	.....
18 to 24 ins.	.85	7.00	.....
2 to 3 ft.	.95	8.00	.....
EUONYMUS JAPONICUS. Evergreen Euonymus.			
18 to 24 ins.	$0.75	$ 6.00	.....
2 to 3 ft.	.90	7.50	.....
3 to 4 ft.	1.25	10.00	.....

	Per Each	Per 10	Per 100
EUONYMUS PATENS. Spreading Euonymus.			
12 to 18 ins.	$0.80	$ 7.00	.....
18 to 24 ins.	1.00	8.50	.....
2 to 3 ft.	1.25	10.00	.....
EUONYMUS RADICANS. Wintercreeper.			
12 to 15 ins., BR.	$0.20	$ 1.50	$12.50
15 to 18 ins., BR.	.25	2.00	15.00
EUONYMUS RADICANS CARRIEREI. Glossy Wintercreeper.			
12 to 15 ins., BR.	$0.20	$ 1.50	$12.50
15 to 18 ins., BR.	.30	2.50	20.00
18 to 24 ins., BR.	.50	4.50	40.00
EUONYMUS RADICANS COLORATUS. Spreading Wintercreeper.			
12 to 15 ins., BR.	$0.20	$ 1.50	$12.50
15 to 18 ins., BR.	.30	2.50	20.00
18 to 24 ins., BR.	.50	4.50	40.00
ILEX OPACA. American Holly. Standard or Bush Form.			
4 to 5 ft.	$3.00	$27.50	.....
5 to 6 ft.	4.00	37.50	.....
6 to 8 ft.	5.00	47.50	.....
8 to 10 ft.	7.00	65.00	.....

	Per Each	Per 10
ILEX VOMITORIA. Yaupon.		
2 to 3 ft.	$1.25	$10.00
3 to 4 ft.	1.75	15.00
4 to 5 ft.	2.50	20.00
LAUROCERASUS CAROLINIANA. Cherry Laurel. (Nice, young stock. Well filled, compact plants.)		
4 to 5 ft.	$1.50	$12.50
5 to 6 ft.	1.75	15.00
6 to 8 ft.	2.00	17.50
MAHONIA AQUIFOLIUM. Oregon Hollygrape.		
15 to 18 ins.	$0.90	$ 7.50
18 to 24 ins.	1.25	10.00
24 to 30 ins.	1.50	12.50
30 to 36 ins.	1.75	15.00
NANDINA DOMESTICA.		
18 to 24 ins.	$0.75	$ 6.00
2 to 3 ft.	1.00	8.00
3 to 4 ft.	1.25	10.00

Established 1887
By J. H. H. Boyd

FOREST NURSERY COMPANY, INC.

McMinnville, Tennessee

J. R. Boyd
President

methods of handling that it would need a book in itself. There is material here, however, for many pleasing fall pictures.

Because sunflowers are sunflowers, they are often disdained by gardeners. That is one of the reasons, I suspect, that Helianthus maximiliani is not more often used. It is somewhat coarse, of course, and needs care in its placing, but its graceful sprays of golden suns on plants to six feet in height cannot well be ignored by gardeners who want to carry the colorful scene right up to the snow line. I have a notion, though, that the coarseness of the sunflowers has less to do with their unpopularity with gardeners than the fact that their need for frequent division and resetting in fresh soil is

not generally recognized. Anyway, if the plants are divided every third year at least, they are quite sure to please any gardener.

If the plants in our present enumeration had been entered in the order of their preference, the baby's breaths would have been near the top. One kind, Gypsophila oldhamiana, at least, is of supreme importance in the autumn garden. All baby's breaths from the little alpines to the 4-foot or taller G. pacifica have special value, because of their light airy effects, in creating pleasing landscape pictures, but our present plant, G. oldhamiana, is especially commendable. Even if it bloomed earlier it would still be useful, but a late August to October flowering period makes it a "must have" for the gardener with late flowers in mind. Fortunately for the plant grower, it is one of the easiest of the baby's breaths to handle, its sort of tuberous root making it easy to transplant. If a plant of lower stature is desired, the foot-tall G. repens bodgeri is ready to answer the call. It commences to bloom in June here in northern Michigan and carries its heaviest load of pretty semidouble white flowers during the succeeding two months. But it keeps right on into October, with always enough color to make it noticeable. The first-named is best grown from seeds, while the repens variety does best here from cuttings taken in early spring and rooted indoors. I suspect, though, that they could be handled in a close frame outdoors.

Generally speaking, eupatoriums seem to have made little impression on American gardeners. That is probably because none of the readily available kinds is really showy. If they bloomed in June, I could understand why they would be overshadowed by the brilliance of that season, but many of them wait until autumn to put on their performance, and then anything in the way of a flower is valuable. For instance, the feathery, pure white heads of the snow thoroughwort, Eupatorium urticaefolium, would probably be overlooked in opulent June, but are welcomed in September by many a discerning gardener. Put it in a partly shaded place in rich woodsy soil and it will attain a height of four feet and light up the autumn scene with its white flowers—one of the few whites, except the capricious Japanese anemones, of that season. The mistflower, E. coelestinum, with its ageratum-like, bluish-lavender heads, on 18-inch stems, from August into late September or early October, is also worthy of attention.

Little space will be taken for Japanese anemones. If your section is adapted to their culture, you probably are using them now; if you operate in the northern tier of states, you are probably well advised when you are told to go slowly with them unless you have proved to your own satisfaction that they are adapted to your local conditions. Where they can be well grown without too much fuss, there is no lovelier or more useful autumn flower.

Since Gypsophila oldhamiana has reached gardens, with its airy habit, there is less need for Statice latifolia as a lightening ingredient of autumn pictures. It still has its uses, however, and I should dislike to get along without it. I have a notion, too, that more gardeners would use the plant if they were shown how lovely and spectacular an old clump can be. Another old favorite, Campanula carpatica, often overlooked in the rush for new things, can be made useful in autumn gardens by shearing off the flower stems of the first crop before they have had a chance to produce seeds. The cheerful little weed, Corydalis lutea, may also be depended upon to give its contribution of yellow to the fall scene if the gardener has not been too meticulous in his weeding. It is a plant to be introduced into the garden and allowed to manage things in its own way, be its selection for a home site in rock garden or border.

I had hopes when these notes were started that there would be room to dwell at some length on the virtues of one of the bush clovers, Lespedeza sieboldi, but we shall have to make the remarks brief. Although it is a shrub in its native Japan, it acts as an herb this far north and is not always able to get through our winters in that form. Nor does it ever produce seeds here, and that would be a drawback to its propagation even if it were hardy. Farther south its long drooping racemes of rose-purple (it is not so bad as it sounds) legume flowers all during September would be an exciting addition to the autumn garden.

PEACH BORER CONTROL.

Peach trees weakened by the extreme temperatures of last winter or by the wet spring season should be protected from further injury caused by the peach tree borer. The adult moths of this pest have been active throughout the summer and early fall, depositing eggs near the ground on the trunks of the trees. Borers hatching from these eggs eat their way into the tender inner bark and continue to feed during the warm days of fall and spring. Gummy masses exuding from the tree trunks near the base usually indicate peach borer injury. Where no protective measures are followed, more or less complete girdling of the tree may result.

PDB, paradichlorobenzene, either in crystal form or dissolved in oils, will not be effective against the peach borer after the soil temperature drops below 60 degrees. Spring treatments with PDB kill the borers, but only after most of the damage to the tree has been done.

Ethylene dichloride emulsion can be used satisfactorily for peach borer control as long as the soil temperature remains above 40 degrees. The material is applied in liquid form around the base of the tree, using a specified amount for trees of different ages. Five or six shovelfuls of soil are mounded about each tree after treatment. The gas given off penetrates the borer tunnels and kills the young borers. Precautions must be taken, however, since careless use of the ethylene dichloride emulsion may result in serious injury to the trees.

AMAWALK LAND SOLD.

The land occupied by the Amawalk Nurseries, comprising more than 1,000 acres in the historic village of Yorktown Heights, Westchester, N. Y., was sold last month. The properties are reported to have brought $440,000 and were sold for mortgage issues by the trustees, who have managed the property since their appointment by the court in 1937. One tract of 340 acres, occupied by a large residence, 9-hole golf course and clubhouse, was purchased by Joseph Ross, Scarsdale, who will operate the golf course and farm the acres. The tract of 661 acres containing the nurseries proper was taken by a syndicate, which will sell the land in plots of ten acres or larger.

The nursery was started by Maj. Orlando J. Smith, a Civil war veteran and long with the Associated Press. His daughter, Miss Evelyn W. Smith, took over the farm of 249 acres at her father's death in 1908 and increased the area more than threefold.

What's New in War Control Orders

RESTRICT DELIVERIES.

Joseph B. Eastman, director of defense transportation, last month ordered restrictions on all wholesale and retail motor truck deliveries in the nation, by amendment 3B to general order 17.

The restrictions are the same as those which have been in effect in the twelve eastern states and the District of Columbia since last spring. They will become effective at 12:01 a. m. Monday, October 11.

The restrictions include: 1. A prohibition against the retail delivery of packages which weigh five pounds or less or measure sixty inches or less in length and girth combined. 2. Limitations upon the frequency of retail and wholesale deliveries of certain commodities. 3. A prohibition against Sunday retail deliveries except of ice, milk or cream.

No new restrictions are imposed, so that nurserymen within the eastern gas shortage area will experience no change in regulation since amendment 3A was issued on June 18. For nurserymen in the rest of the country the following summary of the regulations is given by R. P. White, executive secretary of the American Association of Nurserymen:

"(1) No restrictions are imposed on either wholesale or retail deliveries, provided a capacity load is carried in the largest truck ordinarily used for such wholesale or retail deliveries, and the delivery is from one point of origin, to one consignee, to one point of destination.

"(2) For less than capacity loads, or for capacity loads to be delivered to more than one consignee, the following regulations apply:

"(A) For delivery of live plants for food production, five wholesale and three retail deliveries per week.

"(B) For all other nursery stock, two wholesale and two retail deliveries per week.

"(C) No retail delivery is to be made unless the article, package or lot of goods to be delivered, irrespective of the size or weight of individual packages comprising the lot, exceeds sixty inches in combined length and girth, or weighs more than five pounds, except that this size and weight limitation does not apply to (a) several listed commodities such as milk, dairy products, eggs, laundry, etc., having no relation to the nursery industry; (b) deliveries of property sold upon orders received by mail, telephone, or any other system of public communication; (c) deliveries of property to the address of a person, other than the purchaser, which person is to retain possession of the property; (d) to deliveries made to return or replace property delivered in error or property damaged in transit.

"(D) No restrictions are placed on use of special equipment mounted on trucks used in landscape work, such as power winches, power sprayers, large tree movers, etc.

"(E) No restriction is placed upon the transportation of men to jobs to which plant material may be delivered.

"(F) No restriction in transporting supplies to a farm or farms.

"(G) Delivery areas (size not specified) must be established covering the territory served, said areas not to be duplicating or overlapping, and a map of these areas must be maintained for inspection. You are not allowed to make either wholesale or retail deliveries in these areas on any greater number of days per week than the maximum weekly number of deliveries allowed. For example, two wholesale and two retail deliveries per week may be made in each of these delivery areas which you establish in your trade territory. These deliveries are in addition to those made under (1) with capacity loads. An additional delivery may be made per week if the additional delivery requires the use of a truck specially adapted for the purpose. For example, two retail deliveries may be made during any one week to a customer in each of the delivery areas, of B&B stock on a regular delivery truck, and a third delivery may be made to the same customer during the same week, of a large B&B tree, with tree-mover equipment."

NEW WORKERS' PAY RATES.

Regulation 4 issued by the War Manpower Commission prohibits, in general, the hiring of a new employee at a wage or salary rate higher than that received by the worker at his previous job. However, this restriction does not apply to the hiring of a new employee for agricultural employment. The term agriculture is defined in this connection as meaning, "Those farm activities carried on by farm owners or tenants on farms, in connection with the cultivation of the soil, the harvesting of crops, or the raising, feeding or management of livestock, bees and poultry, and shall not include any packing, canning, processing, transportation or marketing of articles produced on farms unless performed or carried on as an incident to ordinary farming operations, as distinguished from manufacturing or commercial operations."

AID FOR MOTOR OWNERS.

Operators of motor vehicles and of any kind of equipment in which liquid-cooled engines are used can save themselves much trouble and expense by attention to the information and recommendations in a 34-page pamphlet issued by the Office of Defense Transportation under the title "Cooling System: Cleaning, Flushing, Rust Prevention, Anti-freeze."

Prepared for ODT by the Society of Automotive Engineers, the pamphlet fills a real need by providing in a single booklet the best thought of automotive engineers on the care of liquid cooling systems and the liquids used in them.

With the approach of winter, the shortage of permanent types of anti-freeze indicates wide probable re-use

of used antifreeze that should be tested and may need addition of acid and rust inhibitor and fresh antifreeze. The pamphlet's sections on losses of cooling liquid and on antifreeze characteristics will be especially useful. The section on antifreeze tells in detail simple ways to test its strength and what should be done to obtain the safest re-use.

The pamphlet is the latest in an automotive maintenance series prepared by the Society of Automotive Engineers and issued by the Office of Defense Transportation. Any of the series may be obtained from the Office of Defense Transportation, 1147 New Post Office building, Washington, D. C.; from any of the 142 district offices of the ODT division of motor transport, or from regional offices of the ODT office of information.

STOP OIL CONVERSION.

The Petroleum Administration for War announced suspension, for the time being, of its program for the conversion of industrial and commercial oil-burning equipment to the use of coal. In making the announcement, Petroleum Administrator Harold L. Ickes said:

"We are suspending the program in view of the uncertainties in the coal situation, including the shortage of delivery equipment and manpower for retail coal delivery. No one should construe this suspension of the industrial and commercial conversion program as meaning that we are 'over the hump' as far as oil supplies are concerned. War developments might well make it necessary at some future time to resume the program, especially in view of the fact that we are still faced with an over-all shortage of oil in the United States."

This Business of Ours

Reflections on the Progress and Problems of Nurserymen

By Ernest Hemming

THE DROUGHT.

I suppose it is not giving away military secrets to mention the drought that we have had in this area the past summer, as there is considerable mention of it in the local papers. The drought has been centered in the states of Maryland, Virginia, Delaware and West Virginia, extending with lesser severity into the surrounding states. It has been a serious one, the papers mentioning at least a fifty million dollar damage to food crops just when farm food is so sorely needed. After a wet spring, it did not rain worth mentioning during the months of July, August and September, and to top it off in the midsummer we had the longest successive period when the temperature was above 90 degrees each day.

The damage on our own nursery has not been too severe. Being a little short of help, we did not do much spring transplanting, which, of course, would have been what suffered most. Of all the plants we grow boxwood suffers the most because it is a humid climate plant. Azaleas also suffer, but that is largely because they do not like the kind of soil we have, and we do not raise them very extensively. During a drought one, of course, has considerable watering to do, but the extra labor in this direction usually is balanced by the weeding you don't have to do. I have not contacted other nurseries in this section very extensively, but imagine their losses would not be too extensive with perhaps one possible exception, and while I speak without knowing the facts I cannot help but see how the strawberry growers, who run a big business in this section, could have succeeded in producing large quantities of plants under these conditions.

The damage to our customers' plants has been rather extensive, both on newly transplanted jobs and on old plantings; of course, the damage varies with the care given the plants, although, in some cases, plantings suffered in spite of being watered, the air was so hot and dry. We have naturally had the usual customer attitude, which will range from blaming the drought entirely upon us to chalking it up as just one of those things. Our only regret in this matter is that the customer who does not hold you responsible in any way is the customer that you really want to take care of.

The drought has been serious enough actually to kill big trees in the woods, such kinds as certain oaks, beech, dogwoods and pines suffering the most. Particularly noticeable both on the nursery and in the woods is the fact that the trees that die frequently are growing in what is normally a more or less wet spot. The reason, of course, for the paradox is obvious to the plantsman.

While we haven't yet had the rain that will relieve the drought, we have to go on the assumption it will eventually come. At least, the weather is beginning to get cooler, and looking back to 1930, the last year we had a serious drought in this section, we recall an experience that makes us at least somewhat philosophical, for the recuperative power, particularly of young plants, was surprising. Of course, this did not apply to old, weak, big trees, and we also note that many plants went dormant out of self-defense.

E. S. H.

THE CHINESE FIR.

The Chinese fir, Cunninghamia lanceolata, is one of those tantalizing exotic trees that give wonderful promise while young, but is rarely to be seen in a well developed specimen in this part of the country. It is evidently a little too tender, as only those survive to any age that receive the protection of buildings from the northern winds and a rich loamy soil in which to grow.

E. H.

FAGUS SYLVATICA.

The European beech is probably best known by some of its varieties, notable among which are the fern-leaf, purple and weeping forms. The species itself, however, makes a worthy tree. Native of central and southern Europe to Crimea, it attains a height of some ninety feet. With us it is a much smaller tree, rarely exceeding half this height. The leaves, two to four inches long, are dark, glossy green above and quite attractive.

A number of characteristics distinguish the European beech from the American beech. First of all, the tree is more round-headed in general outline and the bark is not so light gray as that exhibited by the American beech. The buds are less pointed and somewhat silky, whereas the American beech has long shiny buds. The foliage is also distinctive. The American beech has longer pointed leaves, that are coarsely toothed. The leaves of the European beech have a shorter tip, are more leathery in texture and have a slightly toothed, wavy margin. The leaves hang on the tree well into the winter.

A deep, rich soil with ample moisture is to the liking of the European

beech. While it is not so impatient of cultivation as the American beech, it should be given much the same soil and exposure.

Beeches should be planted where there is little tramping of the soil over their roots and away from drives and walks. Better still are situations where the leaves can be left to accumulate. Their roots are shallow.

Propagation of the species is by seeds. Most of the varieties are propagated by grafting in the greenhouse during the winter and using the species as the stock. The weeping varieties can be layered.

Uses of the European beech are as a lawn specimen where the right conditions present themselves and as a hedge plant. Fagus sylvatica makes an excellent hedge plant where sufficient room is available. It is best when not restricted below five or six feet and where five or more feet can be allowed for its spread. Once it has gained some size, it will not require more than two or three trimmings a year to keep it in good condition.

L. C. C.

TRY TAMPALA.

Novelties and improved strains are diverting things to try out in the garden, but once in a long while something new comes along which really rings the bell. Some seeds of tampala, a new vegetable to be introduced by W. Atlee Burpee Co. in the spring of 1944, were planted in the editor's garden last spring among the rows of spinach, chard and other greens for the home table. Now that the last plants in the row have been cooked and eaten with enjoyment by the family, tampala can be recommended as something easy to grow, delicate in flavor throughout the summer and as productive in hot weather as in cool.

Tampala is a vigorous grower, reaching a foot in height after a few weeks. At that time pretty nearly the whole plant can be cooked like spinach, for the stems are as tender as the leaves. Or the plants may be permitted to continue growing, and the tender leaves taken off for successive dishes.

Tampala is a horticultural variety of the botanical species Amaranthus gangeticus. It grew well in ordinary garden soil without any special care.

METAL parts of farm machines should be painted with an implement paint or one with a varnish base, which is preferable to one with an oil base, as it dries better and does not come off so readily on hands and clothes.

Control of Cedar Blight in Seedbeds

By C. M. Slagg and Ernest Wright

Cedar blight is becoming a problem wherever cedars are grown. It was first described twenty-five years ago. It is caused by a specific fungus, Phomopsis juniperovora. The amount of blight varies from year to year with the weather and other environmental conditions. It cannot be overemphasized, however, that blight will not occur unless the fungus is present, no matter how favorable other conditions may be. The fungus must be introduced into the nursery before blight can occur.

When blight has become established in a nursery, it is there to stay. The nurseryman then has several alternatives; he can (1) adopt control methods in the infected area, (2) shift his cedar nursery to a new and disease-free location or (3) discontinue growing cedars.

Under favorable conditions blight can destroy entire beds of cedar seedlings. It is often difficult to obtain enough clean seedlings for transplant purposes, and young trees, seemingly clean when taken from beds showing blight, may develop the disease to such an extent later that they cannot be marketed.

This disease is always most severe on eastern red cedar, although all species of juniperus are susceptible.

Appearance of Blight.

Cedar blight always attacks the youngest and most vigorously growing parts of the trees, working back to the stem, branch or trunk. In young seedlings, before side branches or shoots have appeared, the first sign of infection is a graying or dulling of the natural green color of the top. Later, often on the same day, the seedling wilts, the needles often drooping almost parallel to the stem. These needles and the whole top, at this stage of growth, quickly die and turn brown or tan color in striking contrast to the green color of the rest of the plants. First-year seedlings are quickly killed. In warm wet weather in June less than a week may elapse between infection and death of the young trees.

Contribution from the division of forest pathology, bureau of plant industry, United States Department of Agriculture, and contribution No. 444, department of botany, Kansas agricultural experiment station, in cooperation with the Soil Conservation Service Nursery, Manhattan, Kan.

After the seedling has died and dried out, dark brown or black specks may be seen, usually on the upper surface of the needles. These are the fruiting bodies, or pycnidia, of the causal fungus. Under some conditions, these small dark fruiting bodies are also present on the stems of the seedlings and in older trees may occur on the stems more often than on the needles.

Description of Fungus.

The pycnidia produce tiny spores in great abundance, which ooze out under moist conditions and, when spread by rain or insects, infect other seedlings, which in turn die and produce a continuing crop of spores. Single spores can be germinated under sterile conditions in the laboratory and the growth of this microscopic plant can be studied. The mycelium, or vegetative part of the fungus, grows with moderate rapidity on nutrient jelly, called agar, and forms a dark brown or black felty mass. On certain kinds of agar, after the vegetative growth has slowed down and the agar has become somewhat dry, the dark pycnidia are formed just under the surface with a central raised portion breaking through the surface. These dark pycnidia are shaped like a top with the point up. When magnified, a circular opening, or ostiole, is seen at the apex of the fruiting body. Under optimum conditions for their formation in the seedbed, these fruiting bodies often appear as two parallel rows of black dots on each side of the needle, usually on the upper surface, the two rows being almost exactly equidistant from the midrib.

The spores may escape through the ostiole, but in moist weather the pycnidium often ruptures at one or more points, releasing the spores more rapidly. They sometimes adhere to each other, so that as swelling spores behind keep pushing through the ostiole, those in front form a curling rope of spores called a spore horn.

Two kinds of spores are produced in the same fruiting body. The A type is short elliptical in shape and is the most common form. The B type spores are long needle-shaped and are probably only formed under moist conditions. Both types of spores are borne on curved basidia or fruiting spurs that jut out from the inner surface of the pycnidium.

Control Factors.

The most serious damage is done by this disease in the seedbed, and the seedbed likewise appears to be the easiest and surest place to control the disease. An epidemic at Manhattan in 1941 afforded an opportunity to try out a number of methods which it was felt might give promise of control, and experiments were continued in 1942. These experiments will be discussed

briefly. It should be pointed out, however, that the results obtained and the suggested methods of control derived therefrom, as far as we know, are applicable only to the Great Plains and adjacent areas.

In 1941 it was noted that thin stands of seedlings seemed to be more severely diseased than thick stands. When the seedbeds for 1942 were sown in November, 1941, seeds were sown at three different thicknesses in three different beds. The heavy seeding aimed to produce 300 or more seedlings per square foot; the medium seeding, 150, and the thin seeding, seventy-five. An approximation of these numbers was obtained. Careful counts of diseased seedlings disclosed data corroborating the 1941 observations and indicating that under Kansas conditions thinly sown seedbeds are more severely attacked by cedar blight than thickly sown beds. From a practical standpoint a stand of about 100 trees per square foot is probably preferable if lifted after one year's growth, and fifty to seventy-five trees per square foot is more desirable if they are to remain in the seedbeds for two years.

A preliminary experiment in 1941 showed considerably less blight in one section of a seedbed watered by ditch irrigation as compared to an adjacent section watered by overhead sprinkler. A more carefully planned experiment along these lines was laid out in the spring of 1942, but abundant natural rainfall made irrigation superfluous. There seems little doubt, however, that the overhead sprinkler system of watering seedbeds furnishes ideal conditions for the spread of cedar blight. It keeps the seedlings wet for long periods of time, and the spattering drops spread infection easily.

Protective Fungicidal Sprays.

All standard fungicides tested reduced the amount of infection. Those tried included Bordeaux mixture, Bordeaux mixture with arsenicals added, lime-sulphur, Cuprocide, Special Semesan, wettable sulphur, Fermate, Spergon and Thiosan. Many of these were tested in varying amounts. Lime-sulphur, wettable sulphur and arsenic compounds all produced more or less serious burning of foliage. Of the others, Special Semesan, Fermate and Bordeaux mixture gave the greatest measure of control, with Special Semesan considerably better than the others.

Except for burning with compounds containing sulphur or arsenic, as mentioned above, the heavy

and frequent applications of fungicides used caused no visible injuries to red cedar or pine seedlings. The soils of all Bordeaux-treated plots were rendered strongly alkaline. It was calculated that regular weekly Bordeaux treatments throughout the 4-month period added approximately one ounce copper sulphate and one ounce lime per square foot of seedbed soil. On some soils, particularly ones having an acid reaction, it is possible that the total amount of copper salts added to the soil might result in injury to pine seedlings subsequently grown on the area. Increased soil alkalinity is also often associated with an increase in damping-off hazard.

All experimental sprays on first-year red cedar seedbeds were applied with a wheelbarrow sprayer of 15-gallon capacity equipped with a 6-gallon pressure tank and a pressure gauge. A pressure of 180 to 200 pounds was maintained while sprays were being applied. Pressure was maintained by manual operation of the pump handle. Mechanical agitation was accomplished by side paddles attached to the pump piston rod, but most of the time manual stirring was also resorted to in order to insure an even spray on all plots. All experimental plots were separated one from another by heavy cotton cord attached to posts driven securely at the four corners of each plot. All plots originally contained sixteen square feet of seedbed.

Some experimental sprays of second-year red cedar seedbeds were made with a power sprayer, and such an outfit is preferable where large areas must be covered, although good work can be done with a barrel or a wheelbarrow sprayer if the areas are not too large. A small nozzle opening should be used, and the spray materials should contain a spreader, preferably casein.

In 1941 the first blight in the cedar seedbeds was noted on June 5 and in 1942 on June 10. Experimental sprays on one seedbed were started in three series of plots on May 1, June 1 and July 1 to compare dates of beginning the spray program. Comparative counts made July 22 showed more disease in those plots where sprays were delayed until July, but no difference between plots where sprays were started May 1 and June 1. Since infection apparently did not appear in new seedbeds until the first week in June during both 1941 and 1942, it appears likely that under Kansas conditions June 1 is a favorable time to begin protective sprays.

Sprays were applied at 5 and 10-day intervals in 1941, with perhaps slightly more disease with the 10-day interval. In 1942 sprays were applied each week during the growing season. On the basis of experimental seedling inoculation, it is believed the weekly spray will furnish adequate protection, while the 10-day interval may be slightly too long, especially if rains intervene. The object is to keep the youngest growing parts of the seedlings covered with the protective fungicide, as the youngest parts are most susceptible to blight. Under practical conditions in the nursery the interval between sprays may be lengthened during a spell of dry weather, unless overhead watering is used. The protective sprays should be continued until about October 1. At Manhattan in 1942, the most serious spread of blight in the seedbed occurred during the first half of September.

Roguing.

At Manhattan in both 1941 and 1942 removal of blighted seedlings in midseason was distinctly beneficial in reducing the amount of blight in the seedbeds. Under environmental conditions at Manhattan during the 1942 growing season, forty-six unsprayed control plots rogued July 22 and 23 showed an average loss of 7.09 per cent of seedlings by blight during the growing season, while twenty-six unsprayed control plots that were not rogued until October showed an average loss of 28.82 per cent. The combination of roguing and spraying reduced the seedling loss from blight to 1.44 per cent with Bordeaux mixture, to 1.63 per cent with Cuprocide, and to 0.55 per cent with Special Semesan.

Roguing appears to be of considerable importance as a control measure. Certain precautions are necessary, however, if the greatest measure of control is to be attained. These may be summarized as follows:

1. Never attempt to remove blighted seedlings when the plants are wet.

2. Use the fingers or a pair of pliers with close-fitting jaws to remove the diseased seedlings. Gloves are unsatisfactory. It is important to remove the blighted seedlings completely with as little disturbance to the other seedlings as possible.

3. Place the diseased seedlings in a large, heavy bucket which is not easily tipped over. Destroy the seedlings by burning in a place somewhat removed from the seedbeds.

Other Sanitary Measures.

The seedbed should be elevated to allow for drainage and to avoid flooding the seedlings with surface water whenever it rains. If larger cedar trees and hedges are grown at the nursery, blighted parts should be cut out and burned, and such

trees and hedges kept covered with fungicidal spray throughout the growing season. If possible, the cedar seedbeds should be located at some distance from older cedar trees and hedges. Cedar branches and needles should not be used for mulching cedar seedbeds. The seedbed locations should be changed frequently. If this is not possible, steam sterilization of seedbed soil should be practiced. Seedbeds treated by this method require little weeding and the labor thus saved will often more than pay for the cost of sterilization.

If the cedar nursery is free of blight, avoid bringing in nursery stock, particularly cedars, from other nurseries. Transfer of diseased stock from one nursery to another is probably the easiest and surest method of spread of cedar blight.

DN FOR APPLE RED MITE.

Use of the new dinitro insecticides for red mite control on apple foliage promises improved crops with relatively greater safety and more efficient utilization of man-hours than some of the control materials used heretofore by orchardists.

An extensive report on the new insecticides, produced by the Dow Chemical Co. for use either as a spray or dust under the trade designations DN-111 and DN dust D-4, was contained in a recent bulletin of the New York State Horticultural Society.

"Thorough applications of either form," says the bulletin, "result in killing practically all of the hatched stages of many of the eggs. Apparently this dinitro compound possesses considerable residual effect, with the result that many young mites that hatch from untreated eggs, and those from eggs that did not receive lethal amounts of the toxicant, are killed as they move about." This killing frequently takes place some days after the application.

Usually one thorough application suffices for a month or more, according to the report. However, in cases of heavy infestation a second application a week or ten days after the first may be desirable.

Cautioning against use of the new compounds in combination with oils and strongly alkaline materials under certain conditions, the bulletin states, however, that the dinitro products may be safely used in combination with arsenate of lead during the summer.

IF you need fuel for propagating houses, get your supply in early.

New Books and Bulletins

EDIBLE WILD PLANTS.

Particularly valuable if the wartime food supply is drastically reduced but in any event a useful reference work for its comprehensive and authoritative treatment of the subject, "Edible Wild Plants of Eastern North America" has just been issued as a publication of the Gray herbarium of Harvard University, by the Idlewild Press, at $3. The authors are Dr. Merritt Lyndon Fernald, director of the Gray herbarium, and Dr. Alfred Charles Kinsey, professor of zoology at Indiana State University. Between them, they have tested a good many of the plants, and data regarding the remainder have been taken from the literature of the past 300 years, for in modern times the edible qualities of many wild plants have been forgotten.

The opening chaper reads like a cook book, for the most useful wild plants are indicated for various culinary uses. Next follows a chapter describing in detail, with illustrations, poisonous species which might be mistaken for edible ones. A brief treatment is given mushrooms, because they have been fully covered in other works. Most of the book is given over to a detailed discussion of the edible plants, with a number of illustrations. Over 1,000 species of edible plants are reported to be covered in the 458 pages.

LILACS FOR AMERICA.

Because copies of the survey of lilacs conducted by the committee on horticultural varieties of the American Association of Botanical Gardens and Arboretums were made available to the public only in limited quantity, a revised edition has been issued, obtainable at $1 per copy. "Lilacs for America" is of importance to nurserymen because it contains a recommended list of 100 varieties of common lilacs and early hybrids—useful data for any grower or dealer who wishes to curtail his list, yet give customers the best varieties available. The 64-page booklet further includes notes and comments on other varieties and an alphabetical list of those grown today, with data concerning each.

The revised edition, prepared like the original edition by John C. Wister, chairman of the association committee on lilacs, corrects some mistakes and adds notes acquired in two more blooming seasons in reference to the behavior of certain novelties. The booklet was published for the association by the Arthur Hoyt Scott Horticultural Foundation, Swarthmore College, Swarthmore, Pa., of which John C. Wister is director. It deserves a place in the reference library of every nurseryman who grows lilacs or offers them for sale to the public.

BULLETINS RECEIVED.

"Effect of Fertilizer on Growth and Composition of Carpet and Other Grasses," by R. E. Blaser and W. E. Stokes, technical bulletin 390 of the Florida agricultural experiment station, Gainesville, reports the results of tests to show the effect of liming and fertilization on carpet and other pasture grasses commonly utilized in Florida.

"Mycorrhizae and Phosphorus Nutrition of Pine Seedlings in a Prairie Soil Nursery," by A. L. McComb, research bulletin 314 of the Iowa agricultural experiment station, Ames, presents a description of difficulties encountered at a state tree nursery and some experiments carried out to ascertain the causes of poor growth. In O'Neil sandy loam soil, pine seedlings failed to grow unless they developed mycorrhizae. Formation of mycorrhizae and satisfactory growth followed inoculation of the nursery soil with duff and humus from a healthy pine plantation. Fertilizer experiments using jack pine and other species of conifers on uninoculated soil showed that good growth followed phosphorus fertilization, while little or no response was obtained with nitrogen. Seedling growth following phosphorus fertilization was approximately equal to that obtained when unfertilized soil was inoculated with humus containing mycorrhizal material. Factors possibly of importance in the phosphorus nutrition of pine are discussed. It is suggested that failure of nonmycorrhizal pines on O'Neil soil may be due to a low level of root respiration, and that root respiration and activity may be stimulated by secretions from mycorrhizal fungi and by phosphorus.

WEATHER AND OIL SPRAYS.

What effect temperature and rainfall, particularly the latter, may have on the killing action of oil sprays applied to dormant trees is indicated by results of tests carried out at the New York experiment station at Geneva and briefly summarized in a recent bulletin from the station.

The experiments were planned so as to measure the amount of oil deposit remaining on twigs and branches when the sprays were applied while the bark was wet, when rainfall in varying amounts occurred immediately after spraying, when rainfall occurred thirty minutes to an hour later and when rain occurred twenty-four hours after spraying. Twigs of trees carrying egg masses of the fruit tree leaf roller were used in the tests, and the efficiency of the oil spray was determined by the mortality of the eggs. The twigs were sprayed with standard orchard power equipment. The "rainfall" was artificially produced, but it closely resembled natural precipitation.

The results obtained in this test are merely indicative, but substantiate beliefs held generally by fruit growers, say the station specialists in commenting on the experiment. For example, if rain occurs before an oil spray is dry, some of the deposit will be lost and most of the oil will be lost if rainfall is heavy. After the spray deposit has dried, however, it is resistant to the washing action of rain.

The data obtained by spraying the wet bark are interesting in that a literal interpretation of the results might appear to favor this procedure, whereas the popular belief is that spraying wet bark tends toward a lighter spray deposit than when treatment is made on dry bark. "The sounder practical conclusion," say the station workers, "is probably that growers need not wait until trees are completely dry to start spraying operations where oil sprays are involved."

GRASS IS WARTIME CROP.

Grass is a wartime crop of major importance, and production of good-quality grass seeds is likely to increase after the war, says the United States Department of Agriculture.

Hay and pastures feed livestock to produce fats, meat and dairy products for the armed forces, for allies and for civilians. Grass furnishes a protective cover for airfields, military cantonments and hospital grounds—and for camouflage. Many of the grasses most needed for military purposes are not vital to the farm program, but others provide feed for food animals, build up the soil and protect against erosion.

M. A. Hein, agronomist of the agricultural research administration, points out that this country needs to produce more grass seeds of every kind than formerly, not only for such civil and military uses, but to supply seeds to our allies after the war and to make up for seeds formerly imported.

Mr. Hein predicts that grass will be one of the most important crops in our future agriculture. He expects more seeds to be used in planting rotation pastures with rapid tall-growing grasses, such as orchard grass, timothy, brome grass and meadow fescue in the humid north; adapted strains of native gramas, buffalo grass, bluestem, wheat grasses and others in the Great Plains and intermountain region for reclaiming abandoned farm lands; legumes and productive grasses in regions where run-down pastures need renovation; seeds of the better turf grasses for airports, highway borders and the development of recreational areas.

The grass-breeding and improvement program of the Department of Agriculture, cooperating with other federal agencies and the state experiment stations, includes testing many species and strains for different regions of the country. About sixty grass species are now under test, with as many as fifteen strains of one species (brome grass) being compared.

CHLOROSIS-RESISTANT ORNAMENTAL SHRUBS.

In localities where trees and shrubs suffer severely from chlorosis, it should be valuable to the nurseryman to know what plants are resistant to this nutritional disease, caused by lack of iron, so that he may recommend the more successful species to his customers.

Chlorotic plants, being unable to manufacture sufficient carbohydrates for normal growth, are usually weak in vigor and suffer severely from winter injury or drought. Aside from the undesirable appearance of the sickly yellow foliage, the fact that such plants may die within a few years after being set out makes them unsatisfactory for planting as ornamentals.

Chlorotic areas are especially common in the state of Utah, and Dr. F. B. Wann, of the Utah State Agricultural College, has devoted much study to the disease. From several years' observations of shrubs on the college campus he has prepared lists of varieties on the basis of resistance or susceptibility to chlorosis. In the first list below are included those which in general have been green and have made good growth on the campus; selections from this list might therefore be recommended for chlorotic areas. The second list includes those varieties which have been chlorotic on the campus and, in general, these should be avoided in an area where chlorosis is prevalent.

1. VARIETIES NOT CHLOROTIC.

Amorpha fruticosa.
Berberis thunbergi.
Berberis vulgaris.
Caragana arborescens.
Celtis occidentalis.
Colutea arborescens.
Euonymus europaeus.
Forsythia intermedia.
Forsythia suspensa.
Forsythia suspensa fortunei.
Forsythia viridissima.
Ligustrum amurense.
Ligustrum vulgare.
Lonicera maacki.
Lonicera morrowi.
Lonicera tatarica.
Prunus triloba.
Rhus cotinus.
Rhus typhina.
Rose Persian Yellow.
Sambucus canadensis.
Sambucus nigra laciniata.
Sambucus racemosa.
Syringa japonica.
Syringa josikaea.
Syringa persica.
Syringa vulgaris.
Tamarix aestivalis.
Tamarix gallica.
Tamarix indica.
Tamarix odessana.

2. VARIETIES CHLOROTIC.

Acanthopanax sieboldianus.
Aralia spinosa.
Buddleia davidi.
Cornus stolonifera.
Corylus avellana.
Cotoneaster acutifolia.
Crataegus oxyacantha.
Cydonia japonica.
Cytisus scoparius.
Deutzia scabra.
Diervilla amabilis.
Diervilla florida.
Diervilla sessilifolia.
Euonymus alatus.
Hibiscus syriacus.
Hibiscus totus albus.
Kerria japonica.
Philadelphus aureus.
Philadelphus coronarius.
Philadelphus grandiflorus.
Philadelphus lemoinei.
Philadelphus virginalis.
Physocarpus opulifolius aureus.
Potentilla fruticosa.
Pyracantha coccinea lalandi.
Rhamnus cathartica.
Rhodotypos kerrioides.
Rhus typhina glabra.
Rhus typhina dissecta.
Spiraea arguta.
Spiraea vanhouttei.
Symphoricarpos albus laevigatus.
Symphoricarpos orbiculatus.
Viburnum lantana.
Viburnum oxycoccus.

STUDY DEVELOPMENT OF ALASKA HIGHWAY.

The National Park Service has been authorized by President Roosevelt to assist the War Department in making a study to insure orderly development along the Alaska portion of the new Canadian-Alaskan military highway. It is expected that the Canadian government will make a similar study along the Canadian portion of the highway.

Secretary of the Interior Harold L. Ickes said that the new route is destined ultimately to become an important travel artery through a great scenic wilderness, one that will be of recreational importance and will serve the settlers who will follow when the road is opened to public travel. This is but a phase of a larger study to be made by the Interior Department's committee on Alaska for the proper postwar realization of industrial and commercial opportunities to be opened up by the new highway which, it is believed, will affect the whole economic structure of the North American continent.

Secretary Ickes said that the National Park Service is the logical agency to make this immediate study because of its quarter century of experience in administering national park areas and its parkway development of the past decade.

At the request of the Secretary of War, Secretary Ickes last summer withdrew the public lands along the Alaska portion of the Canadian-Alaskan military highway route from settlement or other private uses. The withdrawal covers a strip of land forty miles wide, leaving a protected zone of twenty miles on either side

of the highway. Before any of these lands are opened to use after the termination of military needs, it is essential that land utilization plans be approved in order to prevent unsightly developments along the highway and to assist in cushioning the postwar unemployment problem.

Allyn P. Bursley, who will be the chief of the National Park Service part, has already left for Alaska. The National Park Service and the Public Roads Administration, which constructed the Alaska portion of the highway for the War Department, have for many years collaborated in park and parkway road developments.

Involved in the study now being initiated are problems concerning the protection of the scenic and scientific features along the highway and the selection of natural areas for park and recreational purposes, considered in their proper relation to the general plan of physical developments, including communities.

Approximately 1,360 out of a total length of 1,671 miles of the Canadian-Alaskan highway are in Canada. Officials of the governments of Canada and the United States will collaborate in developing a policy for the protection and use of the lands along the entire length of the highway. Canada has already reserved an area of over 10,160 square miles bordering the northern section of the Canadian portion of the highway and adjacent to the southern part of the Yukon territory-Alaska boundary for establishment as a national park. The Canadian Minister of Mines and Resources has suggested the possibility, because of the highly scenic quality of the region, of eventually establishing an international park on both sides of the boundary in the region of the St. Elias mountains.

POLLINATION PATENT.

A recent patent on a device to aid in the pollination of trees has been issued to Matthew W. Patton, Portland, Ore. Summary of the patent description follows:

"The improved apparatus for promoting pollination of fruit trees through an artificially induced air current, said apparatus including a vehicle, a means supported on said vehicle for projecting an air current upwardly through the branches of the trees at an oblique angle from the ground, a second similar means on said vehicle spaced from and in tandem relation with said first means for projecting a second air current similar to and in the same direction as the first-mentioned current, the distance between said means on said vehicle being such

that the paths of their projected air currents will join in the trees and produce the effect of prolonging the initial air current as the vehicle is moved along the ground, whereby said air currents will act to raise the pollen and hold a substantial percentage of it in suspension in the air for a brief period and then permit it to drop downwardly."

FRUIT TESTERS MEET.

At the twenty-fifth annual meeting of the New York State Fruit Testing Cooperative Association, at the experiment station at Geneva recently, no new varieties of fruit were named by the association this year, although a late, dark-colored sweet cherry of English origin known as Noble was added to the list of fruits distributed by the association during the year.

The need for hardier varieties of fruit for New York state, particularly peaches, was brought forcibly home to the fruit testers by the smallness of the exhibit of new fruits which has always been a notable part of the meeting of the association. Only two lots of peaches were on display. One was a few specimens of Oriole grown on the station grounds and the other a plate of the Colora variety grown by Ward Metcalfe, Webster, and reported by him to have produced a commercial crop despite a minimum temperature of 22 degrees below zero.

CATALOGUES RECEIVED.

Mount Arbor Nurseries, Shenandoah, Ia.—Fall wholesale trade list of fruit trees, small fruits, deciduous trees and shrubs, evergreens, roses and perennials, 80 pages and cover, 6x9 inches.

Griffing Nurseries, Beaumont, Tex.—Wholesale catalogue of broad-leaved and coniferous evergreens, deciduous trees and shrubs, citrus fruit trees and roses, 20 pages and cover, 8½x10½ inches.

Jewell Nurseries, Inc., Lake City, Minn.—Wholesale price list of deciduous and coniferous lining-out and finished stocks, perennials and roses, 48 pages and cover, 5¼x8¼ inches.

Willis Nursery Co., Ottawa, Kan.—Fall wholesale list of shade trees, evergreens, fruit trees and small fruits, shrubs, vines, roses, hardy perennials and culinary herbs, 36 pages and cover, 5½x8½ inches.

Evergreen Nursery Co., Sturgeon Bay, Wis.—Advance wholesale trade list of lining-out stock, 8-page folder, 3¼x8¼ inches. Separate surplus list of spruce, pine and arborvitae, one sheet, 8½x11 inches.

Armstrong Nurseries, Ontario, Cal.—Fall retail catalogue of bulbs and berry plants, illustrated in color, 16 pages, 7¾x10¾ inches. Four-page folder of fruit trees, small fruits, camellias and roses, 7¾x11 inches.

Bobbink & Atkins, East Rutherford, N. J.—Retail fall catalogue of roses, hardy perennials, flowering shrubs, ground covers and herbs, profusely illustrated in color, issued as supplement to larger spring retail catalogue, 24 pages, 9x12 inches.

FILING EXPRESS CLAIMS.

A nursery shipment was lost in transit by express from Iowa to North Carolina, and the nursery company sued the express company. But the court of appeals decided that the suit was barred through failure to give the express company written notice of nondelivery within six months and fifteen days after the date of shipment, as required by the terms of the bill of lading.

The court decided that verbal notice would not suffice and that the express company could not be deemed to have waived failure to file the claim, since to permit the company to waive timely filing of claims in some cases and to insist on timely filing in others would constitute unfair discrimination between shippers.

ABOUT 60,000 agricultural workers from abroad have come into the United States to help in food production and harvest. About 44,000 came from Mexico, others from Jamaica and the Bahamas.

CLASSIFIED ADS

Five lines, $1.00,

each additional line, 20 cents, per insertion.

Let these little liners move your stock easily and cheaply.

EVERGREENS—Lining-out

EVERGREENS, L.O. STOCK	Per 100	Per 1000
Red Pine, 3-yr. s., 10 to 12 ins.	$1.00	$7.50
Red Pine, 4-yr. tr., 10 to 18 ins.	1.50	11.00
Norway Spruce, 4-yr. tr., 12 to 24 ins.	4.00	35.00
Norway Spruce, 3-yr. tr., 3 to 10 ins.	2.00	15.00
Blue Spruce Colo., 3-yr. s., 4 to 8 ins.	1.50	12.50
Bl. Sp. Colo., 4-yr. tr., 6 to 12 ins.	4.00	35.00
White Pine, 3-yr. s., 4 to 8 ins.	1.00	7.00
Chinese Arb., 4-yr. tr., 12 to 30 ins.	2.50	20.00
Balsam Fir, 3-yr. s., 4 to 8 ins.	2.00	15.00
Blue Douglas Fir, 3-yr. s., 6 to 10 ins.	2.00	15.00
White Spruce, 3-yr. s., 5 to 8 ins.	2.00	15.00
Black Spruce, 3-yr. s., 10 to 12 ins.	2.00	15.00

Cash please. No C.O.D.
JOHN ZELENKA,
R. 2, Box 179, Grand Haven, Mich.

EVERGREENS	Per 100
Colorado Juniper, tr., 12 to 15 ins.	$10.00
Douglas Fir, s., 6 to 8 ins.	2.00
Black Hill Spruce, s., 2 to 4 ins.	2.50
Colorado Blue Spruce, s., 4 to 6 ins.	2.50
Oriental Arborvitae, s., 8 to 10 ins.	3.00
American Arborvitae, s., 4 to 6 ins.	2.00
Austrian Pine, s., 8 to 10 ins.	2.50
Colorado Blue Spruce, tr. x, 10 to 12 ins.	12.00
Norway Spruce, tr., 12 to 18 ins.	5.50
Japanese Spurge, 6 to 8 ins.	3.00

WESTFIELD EVERGREEN NURSERY,
Westfield, Wis.

EVERGREENS—Specimen

SPECIMEN EVERGREENS.

Excellent stock for October shipment with J. B. certificate in carload lots.

Taxus Cuspidata, 15 ins. to 8 ft.
Taxus Cuspidata Capitata, 7 to 12 ft.
Taxus Media Hicksi, 1½ to 3 ft.
Taxus Nana (brevifolia), 1 to 2½ ft., and many other items. Ask for prices.

BULK'S NURSERIES, Babylon, L. I., N. Y.

Surplus Stock
can be easily and quickly turned into
Cash
listing it in the
American Nurseryman Classified Ads.

HARDY PLANTS

IRISES. One each of 100 varieties labeled, including Naronda, Rosy Wings, Beowulf, Indian Hills, Golden Hind and many other new and choice varieties all for $7.50. 100 Grape Hyacinths blooming size for $2.00. Lupine seed (Russell's), 75c per oz., $10.00 per lb.

SMITH GARDENS, Clarkston, Wash.

MINNESOTA GARDEN CHRYSANTHEMUMS. Boreas, Duluth, Harmony, Moonglow, Redwing, Welcome, Chippewa, Purple Star, Red Gold, Sun Red. Clumps, 30c each. Cash.

PERKINS BROS., R. R. 6, St. Paul 9, Minn.

ACONITUM SPARKS VARIETY.
No. 1 tubers.....$10.00 per 100; $80.00 per 1000

CORLISS BROS., INC., NURSERIES,
344 Reynard Street, Gloucester, Mass.

PACHYSANDRA
2½-in. pots, $60.00 per 1000.
NICK'S NURSERY, Anchorage, Ky.

Peonies: Tree and Herbaceous, best varieties. Oberlin Peony Gardens, Sinking Spring, Pa.

LINING-OUT STOCK

EVERGREEN SEEDLINGS	Per 100
Abies Balsamea, 4 to 8 ins.	$1.50
Pseudotsuga Taxifolia (Douglas Fir), 4 to 8 ins.	1.00
Juniperus Scopulorum, 18 to 24 ins.	10.00
Larix Americana, 12 to 16 ins.	5.00
Larix Sibirica, 6 to 8 ins.	3.00
Pinus Ponderosa, 4 to 10 ins.	1.00
Pinus Sylvestris, 4 to 8 ins.	1.00
Pinus Sylvestris, 8 to 16 ins.	2.50
Picea Engelmanni, 3 to 5 ins.	1.50
Picea Pungens, 3 to 5 ins.	1.50
Thuja Occidentalis, 3 to 5 ins.	1.00
Picea Excelsa, 4 to 8 ins.	1.50

Packed Free. Trade List on Request.
C. WILSON'S NURSERY, Pembine, Wis.

Hemlock transplants, strong rooted. Write for prices. Twin Cedar Nursery, Williamsburg, Mass.

SEEDS

NEMATODE-RESISTANT PEACH SEED.

U.S.D.A. Introductions from India and China. Shalil and Yunnan 55885 and 55886. Harvesting now completed and orders being filled.

KIRKMAN NURSERIES,

P. O. Box 809, Tracy, Cal

SHRUBS and TREES

TREES AND SHRUBS.	Per 100	Per 1000
Barberry Thunbergi, 24 to 30 ins.	$10.00	$ 80.00
(3-yr. field-grown), 30 to 36 ins.	15.00	100.00
Buddleia Charming, 2 to 3 ft.	12.00	100.00
Dogwood, White-flowering, 5 to 6 ft.	75.00	.....
Euonymus Americanus, 3 to 4 ft.	30.00	.....
Euonymus Americanus, 4 to 5 ft.	40.00	.....
Euonymus Europaeus, 5 to 6 ft.	50.00	350.00
Forsythia Spectabilis, 18 to 24 ins.	10.00	80.00
Forsythia Spectabilis, 3 to 4 ft.	15.00	120.00
Forsythia Suspensa, 3 to 4 ft.	17.50	125.00
Forsythia Suspensa, 4 to 5 ft.	20.00	150.00
Hamamelis Vernalis, 2 to 3 ft.	20.00	175.00
(Winter-flowering Witch Hazel), 3 to 4 ft.	25.00	200.00
Lilac, common, 18 to 24 ins.	20.00	175.00
(White and Purple), 24 to 30 ins.	25.00	200.00
Lonicera Tatarica Rubra, 12 to 18 ins.	8.00	75.00
Lonicera Tatarica Rubra, 18 to 24 ins.	10.00	85.00
Lonicera Fragrantissima, 3 to 4 ft.	20.00	180.00
Prunus Tomentosa, 2 to 3 ft.	15.00	125.00
(Nanking Cherry), 3 to 4 ft.	17.50	150.00
Shepherdia Argentea (Buffalo Berry), 4 to 5 ft.	15.00	125.00
Sycamore, American, 8 to 10 ft.	75.00	.....
Tamarix Hispida, 3 to 4 ft.	15.00	100.00
Viburnum Americanum, Var. Wentworth, 3 to 4 ft.	25.00	.....
Viburnum Tomentosum, 3 to 4 ft.	20.00	175.00
HARDY ORNAMENTAL VINES.		
Bittersweet, Oriental, 3-yr.	12.00	100.00
Clematis Paniculata, 1-yr. field-grown	12.00	100.00
Euonymus Carrierei, 1-yr. field-grown	10.00	75.00
Euonymus Coloratus, 1-yr. field-grown	10.00	65.00
2-yr. field-grown	15.00	120.00
3-yr. field-grown	20.00	175.00
Hall's Honeysuckle, 2-yr.	10.00	80.00
LINING-OUT STOCK.		
Barberry Thunbergi, 2-yr. s., 12 to 15 ins.	1.50	12.00
15 to 18 ins.	2.00	15.00
Minor (Dwarf Box Barberry), 12 to 15 ins.	6.00	50.00
Boxwood, Hardy Dt., 10 to 12 ins.	12.00	80.00
Hvy., 12 to 15 ins.	16.00	100.00
Cornus Mas, 2 to 3 ft.	10.00	75.00
Hamamelis Vernalis, 3-yr., s. (Winter Fl. Witch Hazel), 12 to 15 ins.	6.00	50.00
15 to 18 ins.	9.00	75.00
Lonicera Maximowicsi (Triple Red Honeysuckle), 2 to 3 ft.	5.00	40.00

W. N. SCARFF'S SONS,
New Carlisle, Ohio.

BOXWOODS

May be successfully transplanted through the fall.

BUXUS sempervirens (standard Boxwood), transplanted, puddled roots:

	Per 100	Per 1000
4-yr., 6 to 8 ins.	$10.00	$80.00
5-yr., 8 to 10 ins.	16.00	150.00
6-yr., 10 to 12 ins.	25.00	225.00
7-yr., 12 to 15 ins.	45.00	.....

15 to 18-in. Specimens—Balled and Burlapped:

Per 10	Per 100
$9.00	$80.00

18 to 24 ins., Balled and Burlapped Specimens:

Per 10	Per 100
$15.00	$125.00

Suffruticosa (Dwarf Boxwood):

	Per 100	Per 1000
4-yr., 4 to 6 ins.	$12.00	$100.00
5-yr., 6 to 8 ins.	20.00	.....

15 to 18 ins., B&B. Specimen Suffruticosa plants each, $2.75; per 10, $25.00.

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Waynesboro, Va.

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Our collection contains 90 per cent of the list published by the Association of Botanical Gardens as "the very finest."

1-yr.-old	$0.25
1½ to 2 ft.	.50
2 to 3 ft.	.75
3 to 4 ft.	1.00
4 to 5 ft.	1.75

(Bushy plants.)
BAGATELLE NURSERY,
Huntington Station, L. I., N. Y.

MAGNOLIA Soulangeana Purpurea, 3 to 4 ft., heavy specimen plants, B&B., each $3.00; per 10, $25.00. 4 to 5 ft., each $4.00; per 10, $37.50. WAYNESBORO NURSERIES, Waynesboro, Va.

Peach pits, $2.50 per bu. Peach trees, leading varieties, $8.00 per 100; $75.00 per 1000. Plum, Apricot, $10.00 per 100; $95.00 per 1000. Concord Grape, 2-yr., $7.00 per 100; $65.00 per 1000. Lining-out Water Oaks, $25.00 per 1000. Black Walnut trees, $15.00 per 100.

Riverdale Nurseries, Riverdale, Ga.

RHODODENDRON HYBRIDS

12 to 15 ins.	$1.00	2 to 2½ ft.	$2.75
15 to 18 ins.	1.50	2½ to 3 ft.	3.75
18 to 24 ins.	2.00	3 to 3½ ft.	5.00

and larger.
BAGATELLE NURSERY,
Huntington Station, L. I., N. Y.

Early-bearing bred-up budded and grafted papershell Pecan trees, Peach, Pears, Figs, Grapes, Plums, Apples, Strawberries, Youngberries, Boysenberries. New Crop Pecan Nuts. Catalogue free.

BASS PECAN CO., Lumberton, Mississippi.

DOGWOOD Pink Flowering, 3 to 4 ft., B&B., $16.00 per 10; $150.00 per 100; 4 to 5 ft. at $20.00 per 10, $180.00 per 100. Less 20% dug without B&B.

WAYNESBORO NURSERIES INC.,
Waynesboro, Va.

WHITE FLOWERING DOGWOOD. A fine block of 500, 5 to 6 and 6 to 7 ft. Given space. Nursery-grown.

C. A. MAUZY & SON, Columbus, Ind.

WANTED

WANTED 25,000 unusual deciduous shrubs and trees, lining out; for cash. For sale, Pieris Japonica, 8 to 12 ins., 25c; 12 to 15 ins., 50c; 15 to 18 ins., 75c; 18 to 24 ins., $1.00.

ALANWOLD NURSERY,
Neshaminy, Bucks Co., Pa.

WANTED.
Seeds.
Fruit trees, nut trees, evergreens, shrubs.

ARTHUR V. LEY, La Plata, Md.

WANTED Clean seed of Clematis Paniculata, 1943 harvest. Advise quantity and price. Address No. 271, care American Nurseryman, 343 S. Dearborn St., Chicago 4, Ill.

SUPPLIES

GIBRALTAR Frost Covers pay for themselves. Most economical, long lasting, also ideal for windbreaks. 6½ ft. wide, price, 50 ft., $13.75; 100 ft., $26.00; 150 ft., $39.00. NEW AMSTERDAM CO., 122 Chambers St., New York 7, N. Y.

COTTONETTE Squares are best for balling. Saves time and twine. All sizes in stock. Write for prices. NEW AMSTERDAM CO., 122 Chambers St., New York 7, N. Y.

CONES

PINE CONES

Beautiful new cones, perfectly shaped, 2¼x1¾x 1¾ ins., $1.25 per 100, $4.00 per 500. Longleaf cones, 5 to 7 ins. and over, per bu., $1.25. Slash cones, mahogany finish, 3 to over 4 ins., $2.00 per 100; 4-in. and over, $3.00 per 100; Slash not new. New Loblolly cones for wreaths, 3 to 4½x2½ ins., $1.50 per 100. Will consider best offer on 25 to 50 bu. Assorted cones, $1.50 per bu. Samples, 50c. Order early as cones are very scarce this year, owing to shortage of labor.

Maryland Nursery, Edmonston, Md.

WANTED

Items of stock which you cannot obtain from your usual sources of supply may be available in an unsuspected place.

You can easily and cheaply find out by placing an advertisement under the "Wanted" heading in the Classified ads, where it will reach several thousand growers of nursery stock.

Forms for next issue open until October 12.

WIDEN SOIL TREATMENTS FOR JAPANESE BEETLE.

The quarantine on account of the Japanese beetle provides that treatments which give appropriate safeguards may be used as a basis of certifying products regulated under the quarantine. Many different materials and procedures may be used to remove or make innocuous infestations of the Japanese beetle that may be in the products offered for movement. The effectiveness of these various materials and procedures differs with the product, the season of the year and climatic conditions that may exist when they are applied. Because of this wide variation, and in order to permit the freest possible use of the various treatments and to take advantage of new facts as promptly as they are developed, regulation 529, issued September 10, modifies the system followed in the past of delaying use of specific treatments until they have been formally authorized. Inspectors will be currently instructed on the treatments that may be used as a basis of certification. They will also be instructed on their range of applicability, the exact details on the dosage, exposure interval, temperature and other requirements needed to assure elimination of infestation, as well as data on the reaction of commodities to treatments when these are available. The instructions give general information about the treatments, the uses of which are authorized.

All treatments must be made under the observation of a department inspector, who will ascertain that all treatment requirements have been met and then issue certification for shipment, provided the materials are protected from reinfestation as may be required.

Treatments have been determined on the basis of their efficiency in destroying Japanese beetle infestations. These treatments have had limited tests with respect to injury to plants or products that may be thus treated, and injury may occur to some plant materials. It is therefore understood that no liability shall attach either to the United States Department of Agriculture or to any of its employees in the event of injury to either plants or products. In the absence of available information as to injury, the owner should ascertain information as to possible injury to a specific lot of plant products by making test treatments of small lots in advance of applying the treatment to large lots.

The inspector's relation to treatments that may be applied as a basis for certification of any material restricted by the quarantine is to supply full information concerning them and to see that the work is carried out as required to assure elimination of infestation. The owner or shipper should recognize this and understand that he is to furnish the equipment and materials used for applying the treatments which are carried out under the observations of the inspector. The owner or shipper must assume all risk of injury to the equipment and responsibility for personal injuries to all individuals other than department employees.

By the new regulations, inspectors are authorized to certify regulated articles when treated under their observation in accordance with instructions issued to them. Treatments are provided for four classes:

1. *Treatment of soil in absence of plants.* Any surface soil or soil in bulk may be treated, provided it is friable and provided the treating material can be applied safely and under conditions which will assure that various stages of the Japanese beetle that may be included in such soil will be rendered innocuous. The following kinds of materials may be used in applying such treatment: Carbon disulphide, lead arsenate, methyl bromide, methyl bromide solution, naphthalene.

2. *Treatment of soil about roots of plants before digging.* Soil of any type may be treated, provided it is friable and provided the treatment can be applied so as to render stages of the Japanese beetle on parts of soil that may adhere to roots of the plant innocuous. The following materials may be used in such treatments: Carbon disulphide, lead arsenate, methyl bromide.

3. *Treatment of soil about roots of plants after digging.* Soil of any type may be treated, provided it is friable and provided that conditions under which the treating material is used will render stages of the Japanese beetle that may be in the soil innocuous. The use of the following materials for such treatments is authorized: Carbon disulphide, hot water, paradichlorobenzene, methyl bromide, ethylene dichloride.

4. *Treatment of fruits and vegetables.* Fruits and vegetables may be

treated with fumigants under conditions that will assure that any stages of the Japanese beetle that may be included in the product are rendered innocuous. In applying these treatments it is important that the chamber in which the treatment is applied is constructed in a manner to assure that the fumigant will be effective. The following materials may be used for fumigation: Carbon disulphide, ethylene oxide, methyl bromide, hydrocyanic acid gas, calcium cyanide.

Information in reference to approved treatments will be supplied to interested parties by inspectors or may be obtained by addressing inquiries to United States Department of Agriculture, Bureau of Entomology and Plant Quarantine, 503 Main street, East Orange, N. J.

AMMONIUM nitrate, which contains about thirty-three per cent nitrogen, will be used by apple growers this year instead of ammonium sulphate, which is being reserved for the preparation of mixed fertilizers under the fertilizer allocation program. One difficulty with ammonium nitrate is that it may not stay in a readily usable form, since it absorbs moisture and may cake up quickly.

ROSE REGISTRATIONS.

The American Rose Society's registration committee has approved applications for registration of the following roses. Notice of these registrations has been sent to rose organizations in foreign countries and trade papers. If no objections are raised before October 27, 1943, the registration of these names will become permanent as of that date, states R. Marion Hatton, secretary:

Mirandy. Hybrid tea. A seedling of Night x Charlotte Armstrong. Originated by Dr. Walter E. Lammerts, Los Angeles, Cal. To be introduced by Armstrong Nurseries in 1945. Plant is described as bushy, upright, with large, leathery, dark green foliage. Moderately hardy. Long-pointed to ovoid buds open to full flowers, with petals upright, four and a quarter to five inches across, with forty to fifty petals of garnet red. Strong, sweet, spicy fragrance. Flowers borne usually singly and abundantly, with good lasting quality. It is claimed to be a different color red than has been seen before, with a different open flower form. It is said to be a plant with more vigor and more resistance to mildew than other roses of its near type.

Waves. Hybrid tea. A seedling of an unnamed seedling x Lucie Marie. Originated by Alex Dickson & Son, Newtownards, Ireland, and to be introduced by Jackson & Perkins Co. in 1944. Plant described as bushy, with heavy, dark green foliage. Ovoid buds, open to full flower four and a half to five inches across, with thirty-five petals of warm Dame Edith Helen pink. Strong fragrance. Flowers borne singly and several together. A free bloomer, with blooms of good lasting quality. It is claimed to have a better foliage, more bloom, less pithy stem and a warmer, richer color than Dame Edith Helen.

Sweet Sixteen. Hybrid tea. A seedling of Mrs. Sam McGredy x President Hoover. Originated by Dr. Walter E. Lammerts, Los Angeles, Cal., and to be introduced by Armstrong Nurseries in 1943-44. Plant is described as bushy, upright, with large, flat, leathery foliage. Hardiness of the plant untested. Buds are long-pointed to urn-shaped, the flower of open form is three and a half to four and a half inches across, with sixteen to twenty petals of salmon-pink, with yellow at base. Strong fragrance. Blooms usually singly and freely and has good lasting qualities. It is claimed to be particularly good as a cut flower, giving a different color combination in both bud and flower.

Mrs. H. M. Eddie. Hybrid tea. Seedling of Mrs. C. Lamplough x Mrs. G. A. Van Rossem. Originated by H. M. Eddie, Sardis, B. C., and introduced by H. M. Eddie & Sons, 1943. Plant described as bushy, vigorous, with large, dark green foliage. Plant of average hybrid tea hardiness. A large long-pointed bud opens to a high-centered bloom which, when fully reflexed, is four and a half to five inches across, with fifty-five to sixty petals of creamy white opening to purest white. Pronounced tea fragrance. Blooms singly and freely and is said to have especially lasting qualities. It is claimed to be a truly weather-proof rose, with flowers opening 100 per cent perfect during wet weather and developing normally under bright sun.

Mrs. Jos. Hiess. Polyantha. A seedling of Roserie x unknown seedling. Originated by R. E. Shepherd, Medina, O., and to be introduced by Gerard K. Klyn. Plant described as upright, bushy, with medium-size abundant foliage. Vigorous and hardy. Ovoid buds opening to cupped flowers one and three-fourths inches across, with forty petals of Mary Wallace pink, white at base. Slight fragrance. Flowers borne five to seven together through entire rose season. It is believed important because of heavy blooming traits on an attractive, practically disease-resistant plant.

REFOREST IN INDIANA.

Indiana requires by law the reforestation of areas where strip coal mines have been operated, and when the representatives of forty coal companies met with the division of forestry recently it was announced that approximately two and one-half million trees would be available this spring. Future planting stock, it was also announced, will consist chiefly of pines and cottonwood, with only small quantities of black locust, black walnut, tulip poplar, red oak and sycamore.

AS YOU NEVER DROVE BEFORE!

Many a soldier owes his life to a commander who drove him to the utmost in battle—*never let him slacken for a single fatal instant!* And after the war, many a worker will owe his economic safety to a leader who drove him continuously for higher Pay-Roll allotments for the purchase of War Bonds!

Despite higher taxes and prices, the average worker still has more money than ever before—particularly on the basis of the *family* income. With others in the family earning, too, just let the worker 'figure it out for himself', and he usually will realize that *now* he can put more into War Bonds than he has been doing.

That's why the Treasury Department has set new quotas for the current Pay-Roll Allotment Drive—*quotas running about 50% above former figures.* These quotas are designed to reach the *new* money that's coming into the family income. Coming from millions of new workers . . . from women who never worked before . . . from millions who never before earned anything like what they are getting today!

The current War Bond effort is built around the *family* unit, and the Treasury Department now urges you to organize your War Bond *thinking*—and your War Bond *selling*—on the basis of your employees' *family* incomes. For details, get in touch with your local War Finance Committee which will supply you with all necessary material for the proper presentation of the new plan to your workers through your labor-management committees.

Today about 30,000,000 wage earners, in 175,000 plants, are buying War Bonds at the rate of nearly half a billion dollars a month. Great as this sum is, *it is not enough!* So turn-to today! Get this new *family income plan working!*

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

YOU'VE DONE YOUR BIT—NOW DO YOUR BEST

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★